







UPLAND KENYA WILD FLOWERS

A FLORA OF THE FERNS
AND HERBACEOUS FLOWERING PLANTS
OF UPLAND KENYA

BY

A. D. Q. AGNEW

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WILD FLOWERS

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PREFACE

THIS Book aims to give amateurs and specialists a means of identifying the herbs and climbers of Kenya above 3000 ft (approximately 1000 metres) altitude. It is meant to fill the gap left by I. R. Dale and P. J. Greenway's *Kenya trees and shrubs* (Buchanan's Kenya Estates, 1961) and A. V. Bogdan's *A revised list of Kenya grasses* (Kenya Government printer, 1958). Both of these books are still available and give an adequate account of their plant groups. A work which is continuing is the *Flora of tropical East Africa*, edited and largely written by botanists at the Royal Botanic Gardens, Kew, England, with the co-operation of local scientists. This is a very full and useful work, but has several disadvantages for the general enquirer. Firstly, it is incomplete, and looks like staying incomplete for a number of years. Second, the whole work will run to several thousand pages and be too bulky and expensive for any but the most serious student, since it treats of all East Africa and not simply Kenya. Finally the sedges (Cyperaceae) have all recently been ordered and keyed by the late Miss D. M. Napper in the *Journal of the East Africa Natural History Society* Nos. 106 (24, 1963), 109 (24, 1964), 110 (25, 1965), 113 (26, 1966) and 124 (28, 1971). They are therefore omitted from this book.

Here then is the first relatively concise account of the Kenya wild flowers and ferns. It includes everything that we have had access to of herbs and climbers, as well as those shrubs omitted from *Kenya trees and shrubs.* It is by no means complete, for new discoveries are continually being made and new research will yield a better understanding of existing material, but I expect it to cover over 90 per cent of the total.

The area covered is roughly central and western Kenya, especially the high altitude centres of population. This area was chosen after much consultation as being that area which could be covered in the field from Nairobi. Two major areas not covered (although naturally most of the species are common to our area) are the coast and the Taita Hills. The area is delimited in the map on p. 2.

While I have been responsible for the editing of this work and its general preparation, its completion would not have been possible without help from numerous experts who have generously given their time. The principal contributor in terms of numbers of entire families is undoubtedly Mr. M. A. Hanid who was my research assistant in the University of Nairobi during 1965–1968 and who was jointly responsible for the 1966 Check List. He wrote the accounts of the following families: Capparidaceae, Chenopodiaceae, Elatinaceae, Liliaceae (except *Aloe*), Linaceae, Lythraceae, Hernandiaceae, Malpighiaceae, Naiadaceae, Onagraceae, Pontederiaceae, Portulacaceae, Smilacaceae, Tiliaceae, Trapaceae, Turneraceae, Zygophyllaceae.

Because researchers may like to refer questions to individual authors, I list below the groups which have been dealt with by every contributing expert.

CONTRIBUTORS

Author	Address	Groups dealt with
Archer, P.	Box 12309, Nairobi.	*Ceropegia*
Earle-Smith, C.	U.S.D.A., New Crops, Research Branch, Beltsville, Maryland 20705. U.S.A.	*Vernonia* sect. Stengelia

Author	Address	Groups dealt with
Faden, R. B.	Botany Department Washington University, St Louis, Mo 63130 U.S.A.	Commelinaceae, Pteridophytes
Gillett, J. B.	East African Herbarium, PO Box 45166, Nairobi.	*Indigofera, Vigna, Tephrosia, Sesbania, Trifolium* and smaller genera in the Papilionaceae
Griffiths, R.	University College of Wales Aberystwyth, Wales.	Primulaceae
Hepper, F. N.	Royal Botanic Gardens, Kew, Richmond, Surrey, England.	Lemnaceae
Ihlenfeldt, H. D.	Freie und Hansestadt Hamburg, 2000 Hamburg 36, Jungiusstrasse 6–8.	Pedaliaceae
Kabuye, C. H. S.	East Africa Herbarium, PO Box 45166, Nairobi.	Oxalidaceae, Boraginaceae (in part)
Kibe, S. K.	Kenya National Parks PO Box 2076, Nairobi.	Ericaceae (in part), Oleaceae, Apocynaceae, Caprifoliaceae, Valerianaceae, Dipsacaceae, Rosaceae, Celastraceae (in part), Balanophoraceae, Rhamnaceae, Sapindaceae
Kokwaro, J. O.	University of Nairobi PO Box 30197, Nairobi.	Geraniaceae
Lye, Kåre	Botanical Institute of Norway, 1432 Vollebekk, Norway.	Aponogetonaceae
Napper, D. M.		Acanthaceae (in part) and Typhaceae
Peterson, B.	Goteborgs Universitet, Botaniska Museet, Frolundagatan 22, Goteborg, Sweden.	Thymeliaceae
Polhill, R.	Royal Botanic Gardens, Kew, Richmond, Surrey, England.	*Crotalaria*, smaller genera, and key to Papilionaceae
Stewart, Joyce	Botany Department, University of Natal, Box 375, Pietermaritzburg, S.A.	Cruciferae (in part), Orchidaceae
Verdcourt, B.	Royal Botanic Gardens, Kew, Richmond, Surrey, England.	Convolvulaceae
De Wilde, W. J. J. O.	Rijksherbarium, Schelpenkade 6, Leiden, Netherlands.	*Adenia*

Author	Address	Groups dealt with
Wood, D.	Royal Botanic Gardens, Edinburgh 3. Scotland.	Hydnoraceae

ILLUSTRATIONS

All illustrations are referred to in the text as well as in the index. The line drawings which accompany the text were all drawn by Mrs. E. M. Tweedie except for two (*Chlorophytum macrophyllum* and *C. gallabatense*) which are the work of M. A. Hanid. They are all half natural size, except for the few 'habit' drawings of large plants such as Aloes, and these are self-evident.

The plates were made up by Mrs. Tweedie using the Check List as a guide for species order and occurrence. Naturally changes in species concepts and taxonomic groupings have led to some of them being in a different arrangement from that finally adopted in the text. Thus some drawings are widely separated from their descriptions, and there are some plates which group together an odd assortment of plants. Again the coverage of species illustrated is patchy. Some families (especially Orchidaceae) have most of their species illustrated while others have very few plates devoted to them. This uneven treatment resulted partly from the varying availability of material for Mrs. Tweedie to draw, and partly to the prior existence of a collection of drawings, made by her over a number of years, which naturally reflected her special interests. The production of a uniform illustrated coverage of the Kenya flora is a task which will occupy some future enthusiast for a much longer time than was available for the preparation of this work.

The writing of this book has been hard but enjoyable work. I hope that it will give as much pleasure to its users as it has to me.

Aberystwyth A.D.Q.A.
October, 1973

THE LAYOUT OF THE FLORA

WITH over two and a half thousand species to be dealt with, many from families which require thorough revision in East Africa, it must always be remembered that this is a first attempt, which will, I hope, become more useful as it becomes more amended. The object has been to present an account of as many of the total number of species present in our area as possible. The species must be defined and identifiable through this book, and thus I have laid emphasis on the keys. These are all strictly dichotomous (asking only two questions at every point) and balanced between the pairs of questions. To the beginner, the number of specialized terms used appears formidable, and although I have attempted to keep these down to the minimum, it is inevitable that the names of leaf shapes, for instance, should be initially unfamiliar. However, even a trained botanist needs to learn to use a new key and I hope that perseverance will yield faster identifications with these keys.

Family descriptions are given here mainly for the benefit of students. Generic descriptions are given for the aid of serious naturalists who may discover new species of a genus or specimens which do not quite 'fit' a key, and who wish to check the generic identification of their plant. Specific descriptions are kept to a short habit description. In some families this is longer than in others, and there is some inconsistency here. For instance the Curcurbitaceae have very short descriptions because the account follows closely that of C. Jeffrey (1967) in FTEA whereas the Orchidaceae have been given longer specific descriptions because of the intricate nature of distinctions within that group. In general I have tried to avoid repeating too many of the characters used in the specific keys within their descriptions.

After the description there is a short statement of the habitat and abundance of the species followed by a number of letters which indicate its recorded range in Upland Kenya. These follow a subdivision of our area into smaller areas which are ecologically more or less homogeneous. The citation of these areas starts in the highlands (prefix H) and continues with the lowlands, giving north-west first and south-east last.

These areas are shown on the map and are defined as follows:

HE : (Highlands Elgon) Kenya Elgon above 6000 ft.

HC : (Highlands Cherangani) Cherangani above 6000 ft on east and 7000 ft on west, bounded on south by line east-west across narrowest point. Includes Mt. Seker over 7000 ft.

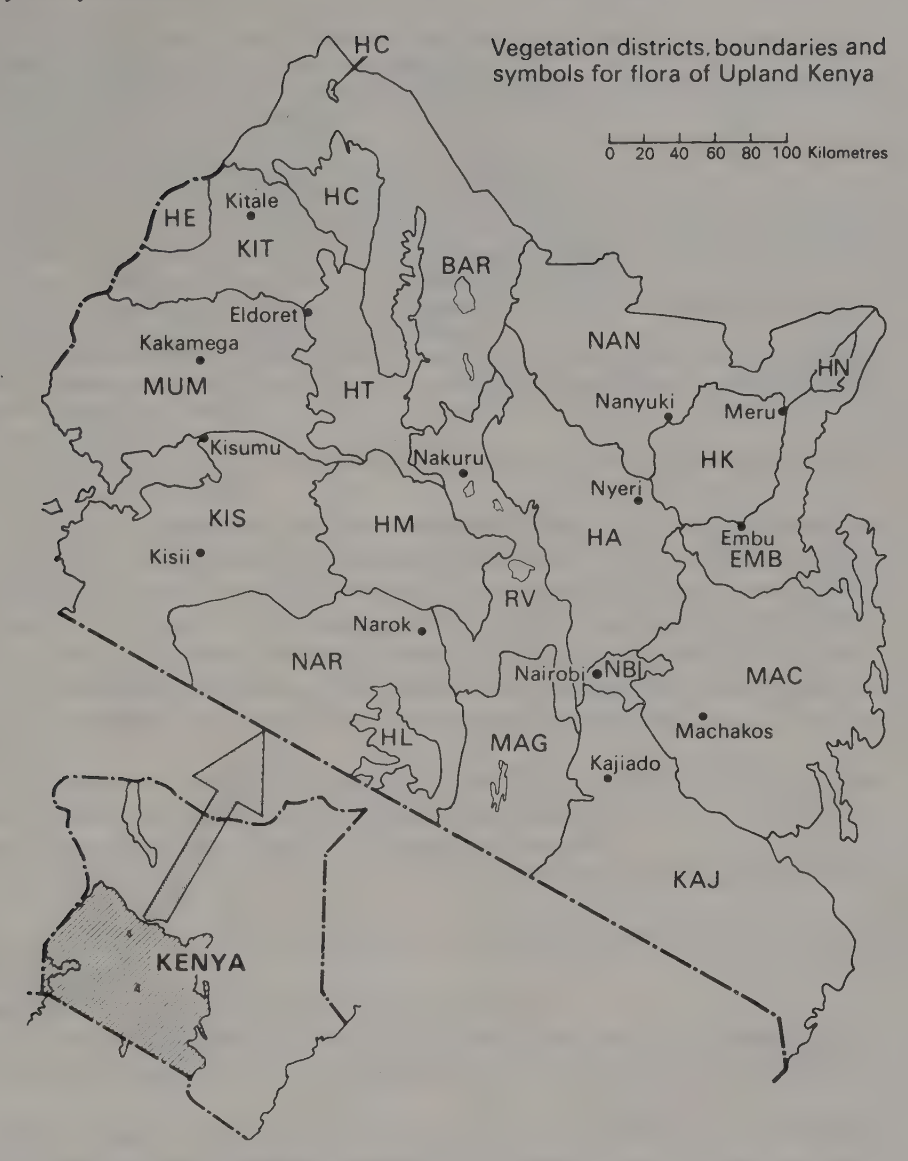
HT : (Highlands Tinderet) Plateau and Tinderet highlands above 6000 ft on east (with the exception of the section between the Nakuru/Baringo district boundary and the Nakuru–Kisumu Railway where the 7000 ft contour is used) and 7000 ft on west, bounded on north by HC and on south by Nakuru–Kisumu railway.

HM : (Highlands Mau) 7000 ft contour defines except in the north where it bounds on HT.

HL : (Highlands Loita) Loita hills above 7000 ft.

HA : (Highlands Aberdares) Aberdare range above 7000 ft on the west (extended along scarp to Ngong in south and straightened to include Marmanet forest in the north). On the east boundary from the north is the 7000 ft contour until the Laikipia/Nyeri boundary which it follows to the Nanyuki railway and then the latter to the 5000 ft contour. This contour is taken south to Fort Hall where the rail line is again used south to the Nairobi extra-provincial boundary, which is taken north and west of Nairobi until an undemarcated 'loop' can extend round the Ngong hills.

HK: (Highlands Kenya) Mt. Kenya above 5000 ft on the south and east, and 7000 ft on the north and west. South-west is the boundary with HA along the railway.



HN : (Highlands Nyambeni) Nyambeni hills over 5000 ft.

KIT : (Kitale) Below 7000 ft (where it borders on HE, HC, and HT), the West Pokot/Trans Nzoia boundary in the north, the Uganda border in the west, and the Eldoret–Tororo railway in the south.

MUM : (Mumias–after the early kingdom) Below 7000 ft (where it borders on HT) and north of the Kisumu–Nakuru railway, its eastern boundary is the Uganda border and Lake Victoria.

KIS : (Kisii) Below 7000 ft (where it borders on HM), the southern boundary is the Tanzania border, its eastern boundary is the Narok/Nyanza administrative boundary (the old Nyanza/Masai provinces or K5/K6 in FTEA).

NAR : (Narok) Below 7000 ft (which defines the boundary with HM and HL), on the west it adjoins KIS, on the south Tanzania, and in the East the boundary extends north from the Nguruman escarpment to the Ewaso Nyiro and thence up the Siyabei river to 7000 ft.

BAR : (Baringo) In the north the administrative boundary with Turkana and Northern Frontier provinces, in the east the 5000 ft contour, and in the south the 6000 ft contour (adjoining HT

and eastern HC) except for the boundary between Nakuru/Baringo districts in the east, and, in the west, the 7000 ft contour on the northern Cheranganis.

RV : (Rift Valley) This is delimited in the south by the 5000 ft contour, and on all other sides by boundaries with NAR, HM, HT, BAR, and HA.

MAG : (Magadi) This adjoins the already delimited NAR in the west, and the remainder of its boundary is given by the Tanzania border and the 5000 ft contour.

NAN : (Nanyuki) This adjoins BAR, HA, HK, and HN as already delimited in the south and east, while the northern edge follows the northern frontier/central province boundary until the 3000 ft contour is reached in the east, which is thereafter followed. The area boundary with EMB is not shown on a map and is simply drawn so as to divide EMB from NAN.

EMB : (Embu) In the east the 3000 ft contour and in the south the Tana River bound this area. The adjoining NAN, HN, and HK have already been delimited.

MAC : (Machakos) The boundaries with EMB and HA have already been stated. In the east the 3000 ft contour delimits the area while in the south the railway (which is also the old central province/Masai boundary, or K4/K6).

NBI : Nairobi extra provincial area.

KAJ : (Kajiado) This is bounded by MAG, RV, HA, MAC, and by the 3000 ft contour in the east, and the Tanzania border in the south.

Lastly, at the end of each species description, is a list of specimens which are cited by the collector's name and number on a herbarium sheet which has been seen by the author and compared with other material from Kenya. This is to allow future workers to use these authentic specimens for an exact revision of the names and concepts used. Mostly two specimens are cited, one from the East African herbarium and one from the herbarium of the University College Nairobi, except in those families which have been written by workers outside Kenya. These include the *Thymeliaceae, Papilionaceae, Convolvulaceae, Pedaliaceae,* and *Lemnaceae,* and within these families specimens are cited from Kew or the East African herbarium only.

Sometimes reference is made to the fact that a species or genus has been mentioned in one of the source works for our area. The titles of these works are abbreviated as follows:

FTA–*Flora of tropical Africa* edited by D. Oliver *et al.*, 1868 and later dates.

FTEA–*Flora of tropical East Africa* edited by W. B. Turrill and E. Milne-Redhead *et al.*, 1952 onwards.

FWTA–*Flora of west tropical Africa* by J. Hutchinson and J. M. Dalziel, edited by R. W. J. Keay and F. N. Hepper, 1954 and later dates.

KTS–*Kenya trees and shrubs* by I. R. Dale and P. J. Greenway, 1961.

Specimens are often cited as 'in EAH' when they are to be found in the East African Herbarium, of which the official abbreviation in the World List of Herbaria (*Index Herbariorum* (1954–9) by Lanjouw and Staflew) is EA.

In the preparation of this book we issued a cyclostyled 'Check List' in 1966 which was widely circulated to schools in East Africa and to scientists overseas. Thus in some places it has been necessary to refer to names that have been used in this list.

Serious students of the flora of Kenya will have to consult the above works from time to time. Beginners who are unfamiliar with botanical terms will find *A Luo-English botanical dictionary of plant names and uses* by J. O. Kokwaro (1972, E. A. Publishing House) extremely useful. The order of families follows J. Hutchinson's *The families of flowering plants, Dicotyledons* (1926) and *Monocotyledons* (1934).

KEY TO THE FAMILIES OF HERBS IN UPLAND KENYA

THIS key is strictly artificial and deals only with those plants which are not in Dale and Greenway's *Kenya trees and shrubs.* Thus it is not useful for all plants found in Upland Kenya, and although it should be possible to look up most herbs or climbers, small shrubs may or may not key out successfully.

Flowering and fruiting material will be needed to key out most families, but one might be able to obtain a short list of the possibilities with incomplete material. If your plant is a fern or bears spores, turn to p. 13.

1 Plants parasitic; (without green colour if growing out of the ground or often with green colour if growing out of tree branches) 2
Plants not parasitic 7

PARASITES

2 Plants climbing with suckers 3
Plants erect, not climbing 4

3 Flowers aggregated 85. Convolvulaceae (530)
Flowers solitary 1. Lauraceae (75)

4 Plants growing out of the ground 5
Plants attached to tree branches 62. Loranthaceae (326)

5 Flowers solitary 8. Hydnoraceae (84)
Flowers in racemes or dense aggregations 6

6 Flowers yellow or blue, in racemes 87. Orobanchaceae (567)
Flowers crimson, in masses 64. Balanophoraceae (338)

7 Floating or submerged aquatics, sometimes closely appressed to rocks in moving streams 8
Terrestrial plants or, if growing in flooded soil, then with emergent leaves 26

AQUATIC PLANTS

8 Plants free-floating, without soil anchorage 9
Plants rooted in the soil or on rocks 16

9 Plants completely submerged 10
Plants with leaves floating or emergent 13

10 Plants with tiny bladders; stem with alternately arranged branches 88. Lentibulariaceae (569)
Plants without bladders; leaves whorled or opposite 11

11 Leaf blade flat 94. Hydrocharitaceae (648)
Leaf blade cylindrical or of fine divisions, not flat 12

12 Leaves simple, opposite 98. Najadaceae (652)
Leaves divided, whorled 4. Ceratophyllaceae (81)

13 Plants stemless 14
Plants with a distinct stem and swollen roots 36. Onagraceae (155)

14 Plants consisting of a rosette of leaves, erect or spreading from a centre 15
Plants consisting of green floating fragments 107. Lemnaceae (706)

15 Leaves with a distinct petiole and lamina 37. Trapaceae (157)
Leaves without a distinct petiole and lamina 106. Araceae (701)

16 Plants appressed to rocks in fast-moving water 20. Podostemaceae (109)
Plants rooted in mud 17

17 Leaves orbicular, mostly floating 18
Leaves linear to ovate, floating or immersed 19

18 Flowers with many petals and stamens, solitary 5. Nympheaceae (81)
Flowers with only 5 petals and stamens, in small clusters 78. Gentianaceae (501)

19 Stems elongated, leafy 20
Plants stemless except for the inflorescence stalk 24

20 Leaves pinnate, in whorls 38. Haloragaceae (158)

Leaves undivided, opposite or alternate 21

21 Leaves stipulate
97. Potamogetonaceae (652)
Leaves without stipules 22

22 Swollen pithy roots present; leaves over 2 cm long 36. Onagraceae (155)
Roots fibrous; leaves less than 2 cm long 23

23 Leaves serrate 94. Hydrocharitaceae (648)
Leaves entire 36. Onagraceae (155)

24 Flowers enclosed in a spathe, at least in bud, or solitary 25
Flowers in a spike-like inflorescence
96. Aponogetonaceae (650)

25 Leaves floating, ovate or heart-shaped; flowers solitary, bisexual
86. Scrophulariaceae (549)

Leaves mostly immersed, linear or oblong; flowers unisexual, solitary or in a spathe
94. Hydrocharitaceae (648)

26 Leaves opposite or whorled 27
Leaves alternate or spiral on the stem or plants with a rosette of leaves and no visible stem 70

LEAVES OPPOSITE

27 Plants with milky latex immediately visible if stem is punctured 28
Plants without milky latex 30

28 'Flowers' surrounded by sticky glands, with minute stamens within, and frequently with the ovary emergent after pollination
53. Euphorbiaceae (210)
'Flowers' without sticky glands or emergent ovaries 29

29 Stamens clearly separable from the stigma
71. Apocynaceae (365)
Stamens fused to or very intimately attached to the stigma 72. Asclepiadaceae (367)

30 Stipules fused between the opposite petioles or leaves constantly in whorls of 4 or more
73. Rubiaceae (396)
Stipules absent or if present free from each other at a node; leaves in whorls of 3 or 3 *and* 4 on the same plant 31

31 Flowers sessile in flat or hemispherical heads 32
Flowers in elongated inflorescences or solitary, if held at the same level then clearly pedicellate 35

32 Central flowers of the head with rounded petal lobes 33
Central flowers of the head without petals or with acute petal lobes 34

33 Leaves with parallel submarginal veins; stamens with a joint below the anther
46. Melastomataceae (180)
Leaves without parallel submarginal veins; stames without joints
76. Dipsacaceae (414)

34 Petals absent; sepals free, narrow
28. Amaranthaceae (130)
Petals present, fused in a tube; sepals absent
77. Compositae (416)

35 Flowers reduced, in a fleshy spike, difficult to separate from each other
9. Piperaceae (84)
Flowers free from each other 36

36 Ovary inferior, below the attachment of the sepals 37
Ovary superior 40

37 Calyx obscure at flowering time, enlarging later 75. Valerianaceae (412)
Calyx always distinguishable 38

38 Leaves pinnate 74. Caprifoliaceae (412)
Leaves simple 39

39 Petals and sepals 4 36. Onagraceae (155)
Petals and sepals 5
82. Campanulaceae (509)

40 Flowers zygomorphic (bilaterally symmetrical) 41
Flowers regular (radially symmetrical) 48

41 Leaves with submarginal parallel veins; filaments with a distinct joint below the anther; corolla almost regular, with spreading lobes 46. Melastomataceae (180)
Leaves without submarginal parallel veins; filaments without a joint except where (in *Salvia*) the corolla is 2-lipped 42

42 Fruit a capsule, if indehiscent then winged or spiny 44
Fruit a berry or dry, splitting into 1-seeded portions when ripe, never winged or spiny 43

43 Flowers mostly in spikes; corolla rarely bilabiate; style apical on ovary
92. Verbenaceae (611)
Flowers mostly in axillary cymes; corolla mostly bilabiate; style attached to base of centre of ovary and surrounded by the 4 1-seeded nutlets 93. Labiatae (616)

44 Flowers spurred 34. Balsaminaceae (149)
Flowers without spurs 45

45 Ovary and capsule with parietal placentation

of ovules and with only one chamber
89. Gesneriaceae (571)
Ovary and capsule with axile placentation of ovules and with 2 or more chambers **46**

46 Flowers solitary; pedicels with 2 glands at base; fruits often winged or armed
90. Pedaliaceae (572)
Flowers mostly in groups; pedicels without glands at base; fruits never winged or armed **47**

47 Fruit hard, widest at the middle or below and gradually narrowed above into a sterile beak 91. Acanthaceae (573)
Fruit usually leathery, always blunt at apex
86. Scrophulariaceae (549)

48 Leaves thick, fleshy **49**
Leaves thin, not fleshy **51**

49 Ovaries of 5 free carpels
18. Crassulaceae (104)
Ovary single within the flower **50**

50 Sepals 2 24. Portulacaceae (119)
Sepals 5 23. Aizoaceae (115)

51 Stamens numerous (more than 3 times the number of petals) **52**
Stamens up to 3 times the number of petals **53**

52 Leaves divided; flowers white to purple
3. Ranunculaceae (75)
Leaves simple; flowers yellow
48. Hypericaceae (183)

53 Sepals, which may resemble petals, and petals (if present) borne at the top of a tube around the ovary **54**
Sepals and petals (if present) borne at the same level as the ovary, ovary superior **56**

54 Perianth in only one whorl, coloured
41. Nyctaginaceae (161)
Perianth in two whorls (sepals and petals) or, if only one whorl, then green or brown **55**

55 Woody climbers or shrubs; fruit winged, indehiscent 47. Combretaceae (183)
Herbs or shrubs; fruit unwinged, dehiscent
35. Lythraceae (153)

56 Petals absent **57**
Petals present (often very small) **62**

57 Stipules present **58**
Stipules absent **59**

58 Leaves entire 22. Caryophyllaceae (110)
Leaves serrate at margins
59. Urticaceae (320)

59 Flowers solitary, sessile, axillary
39. Callitrichaceae (158)
Flowers in terminal or axillary clusters **60**

60 Flowers densely crowded, touching one another in the cluster
28. Amaranthaceae (130)
Flowers in loose clusters, not touching one another **61**

61 Leaves linear; ovary with free-central placentation 22. Caryophyllaceae (110)
Leaves mostly broader than linear; ovary with axile placentation 23. Aizoaceae (115)

62 Stamens 2 70. Oleaceae (364)
Stamens more than 4 **63**

63 Stamens opposite the petals, alternate with the sepals; ovary with free-central placentation 79. Primulaceae (505)
Stamens alternating with the petals **64**

64 Petals joined to each other
78. Gentianaceae (501)
Petals free from each other **65**

65 Plant annual; flowers several together in inflorescences **66**
Plant perennial or, if annual, then flowers solitary **67**

66 Flowers yellow, in terminal cymes; leaves whorled 30. Linaceae (139)
Flowers minutely pink, in axillary clusters; leaves opposite 21. Elatinaceae (110)

67 Ovary divided into three, with 3 stigmas **68**
Ovary divided into five, with 5 stigmas **69**

68 Plant climbing by twining branches; leaves glabrous 60. Celastraceae (325)
Plant without twining branches; leaves hairy
52. Malpighiaceae (209)

69 Fruit spiny or plant with spines at leaf-bases
31. Zygophyllaceae (139)
Fruit smooth, plant unarmed
32. Geraniaceae (140)

LEAVES ALTERNATE

70 Leaves simple, linear, with veins parallel to each other, without veinlets joining the larger ones **71**
Leaves simple or compound, veins forming a network in the leaf **85**

LEAVES WITH PARALLEL VENATION (MOST MONOCOTYLEDONS)

71 Flowers entirely brown or green, with dry perianth or scales which do not shrivel when dry **72**
Flowers coloured or, if brown or green, with a fleshy perianth which shrivels on drying **75**

72 Flowers crowded but individually distinguishable; petals and sepals larger than bracts
115. Juncaceae (802)
Flowers crowded on spikes or spikelets; petals and sepals absent or much smaller than the bracts **73**

73 Inflorescence of one spike with male flowers at the top, female flowers below **74**
Inflorescence compound or of bisexual flowers
Cyperaceae (not dealt with in this book)

74 Leaves flat 108. Typhaceae (707)
Leaves channelled
Cyperaceae (not dealt with in this book)

75 Flowers in heads, sessile **76**
Flowers pedicellate or, if sessile, in spikes **77**

76 Flowers black or white, unisexual
101. Eriocaulaceae (669)
Flowers yellow, bisexual
100. Xyridaceae (669)

77 Ovary inferior, borne below the insertion of the perianth **78**
Ovary superior, borne above the insertion of the perianth **82**

78 Stamens 3 110. Iridaceae (712)
Stamens 1 or 2 or hardly identifiable **79**

79 Flowers zygomorphic (bilaterally symmetrical **80**
Flowers regular (radially symmetrical) **81**

80 Stamen 1, with powdery pollen in normal pollen-sacs which enclose the style
102. Zingiberaceae (669)
Stamens 2 or 1, hardly recognisable as such, consisting of sticky pollen-masses attached to the much larger style
114. Orchidaceae (726)

81 Flowers in an umbel with a paper-thin bract at the base, inner flowers the last to open
109. Amaryllidaceace (708)
Flowers in cymes (that is the centre flower opening first), with a leafy bract at base
113. Hypoxidaceae (724)

82 Perianth of 6 parts, all similar in colour and texture **83**
Perianth of 3 outer green sepals and 3 inner coloured petals
99. Commelinaceae (653)

83 Stamens 3 104. Pontederiaceae (700)
Stamens 6 **84**

84 Leaves fleshy, entire, erect from ground level or plants woody climbers or trees
112. Agavaceae (722)
Leaves spreading or scale-like, if fleshy then with marginal prickles
103. Liliaceae (671)

85 Leaves compound **86**
Leaves simple **103**

ALTERNATE COMPOUND LEAVES

86 Flowers crowded on a central spike, subtended and partially surrounded by a spathe 106. Araceae (701)
Flowers not crowded on a spike or subtended by an enclosing spathe **87**

87 Flowers without petals (although sepals may be coloured); stamens numerous
3. Ranunculaceae (75)
Flowers with sepals and petals (often both green); stamens usually definite in number **88**

88 Flowers with petals and sepals in fours **89**
Flowers with 5 sepals and/or petals **93**

89 Flowers zygomorphic (bilaterally symmetrical) or with fewer stamens than petals **90**
Flowers regular (radially symmetrical) **91**

90 Corolla spreading; stamens 8; fruit inflated
67. Sapindaceae (347)
Corolla tubular; stamens 2; fruit not inflated
11. Fumariaceae (88)

91 Mostly climbers with tendrils; ovary inferior or almost so 66. Vitaceae (340)
Herbs without tendrils; ovary superior **92**

92 Ovary and fruit sessile in the flower
14. Cruciferae (92)
Ovary and fruit shortly stalked in the flower
13. Capparaceae (90)

93 Flowers zygomorphic **94**
Flowers actinomorphic **95**

94 Upper petal inside the two below in bud; stamens free of the petals
55. Caesalpiniaceae (230)
Upper petal outside the two below in bud; stamens enclosed in loosely coherent petals
57. Papilionaceae (237)

95 Inflorescence an umbel **96**
Inflorescence a panicle or raceme or flowers solitary, never an umbel **97**

96 Ovary superior 33. Oxalidaceae (144)
Ovary inferior 68. Umbelliferae (348)

97 Flowers unisexual; plants usually with tendrils 43. Cucurbitaceae (166)
Flowers bisexual; plants without tendrils **98**

98 Ovary inferior — 2. Hernandiaceae (75)
Ovary superior — 99

99 Stamens 2 — 70. Oleaceae (364)
Stamens more than 2 — **100**

100 Stipules absent; stamens 8 — 67. Sapindaceae (347)
Stipules present; stamens more than 8 — **101**

101 Leaves bipinnate; fruit a pod — **102**
Leaves simply pinnate or palmate; fruit of separate 1-seeded carpels — 54. Rosaceae (225)

102 Leaves not sensitive; pods winged — 55. Caesalpiniaceae (230)
Leaves often sensitive; pods unwinged — 56. Mimosaceae (236)

ALTERNATE SIMPLE LEAVES

103 Flowers small; sepals and petals green or brown or absent — **104**
Flowers with white or coloured petals or sepals — **128**

104 Leaves with a stipule at base of petiole which encloses the stem above the axil — 25. Polygonaceae (122)
Leaves with free stipules or none — **105**

105 Flowers in leafless spikes or racemes — **106**
Flowers solitary or in cymes or clusters along the stem, or in heads, never in simple racemes, — **114**

106 Flowers very reduced so that it is impossible to distinguish the perianth of individual flowers — **107**
Flowers frequently crowded but with distinguishable perianths to each flower — **108**

107 Spikes surrounded and subtended by an enlarged bract (spathe) — 106. Araceae (701)
Spikes without a subtending modified leaf — 9. Piperaceae (84)

108 Petals present — **109**
Petals absent — **110**

109 Plant a weak woody climber; inflorescence pendulous — 61. Icacinaceae (326)
Plant an erect herb; inflorescence erect — 16. Resedaceae (100)

110 Perianth of paper-like acute sepals which do not wrinkle when dry; fruit with one seed — 28. Amaranthaceae (130)
Perianth soft, wrinkling when dry; fruit either of 1-seeded carpels or with many-seeded carpels — **111**

111 Flowers bisexual — **112**
Flowers unisexual — **113**

112 Flowers in leafless racemes — 26. Phytolaccaceae (127)
Flowers in clusters or, if solitary, then subtended by leaves — 27. Chenopodiaceae (127)

113 Perianth segments in threes; fruit of 1–3 free carpels, each with one large curved seed — 6. Menispermaceae (82)
Perianth segments in fives; fruit of 3 fused carpels, each with 1 or 2 ovoid seeds — 53. Euphorbiaceae (210)

114 Flowers sunk in flat fleshy heads — 58. Moraceae (318)
Flowers in other types of inflorescence — **115**

115 Ovary below the origin of the sepals and stamens — **116**
Ovary above the insertion of the sepals and stamens — **121**

116 Inflorescence an umbel or with all flowers held at the same level — **117**
Inflorescence of groups of flowers at the nodes or in racemes — **118**

117 Often tendrillate climbers; flower parts in fours — 66. Vitaceae (340)
Mostly herbs, never tendrillate; flower parts in fives — 68. Umbelliferae (348)

118 Petals very small, held just under anthers — 65. Rhamnaceae (335)
Petals absent — **119**

119 Leaves stipulate — 54. Rosaceae (225)
Leaves without stipules — **120**

120 Leaves with crenate or serrate margins; flowers crowded in terminal panicles or axillary — 38. Haloragaceae (158)
Leaves entire; flowers solitary or in groups of 2–3, not crowded — 63. Santalaceae (334)

121 Stipules present — **122**
Stipules absent — **124**

122 Stigmas 2 — 59. Urticaceae (320)
Stigmas 3 — **123**

123 Petals absent; stigmas often forked; ovary with 3–6 ovules — 53. Euphorbiaceae (210)
Petals present, small; stigmas entire; ovary with 1 ovule — 22. Caryophyllaceae (110)

124 Flowers unisexual — 6. Menispermaceae (82)
Flowers bisexual — **125**

125 Petals absent — **126**
Petals present — 61. Icacinaceae (326)

126 Perianth stiff and papery, drying without collapsing — 28. Amaranthaceae (130)
Perianth soft, fleshy — **127**

127 Sepals fused into a tube at base; ovary with more than 1 ovule 23. Aizoaceae (115)
Sepals free; ovary with 1 ovule 27. Chenopodiaceae (127)

128 Flowers zygomorphic (bilaterally symmetrical) or with fewer stamens than petal lobes **129**
Flowers actinomorphic (radially symmetrical) **144**

LEAVES ALTERNATE, SIMPLE; FLOWERS ZYGOMORPHIC

129 Flowers with a spur at base **130**
Flowers without a spur at base **134**

130 Flowers in a raceme **131**
Flowers solitary or in axillary groups **133**

131 Petals fused into a tube; ovary one, with axile placentation **132**
Petals free; ovary of 1–3 free carpels 3. Ranunculaceae (75)

132 Leaves borne on the erect stems 86. Scrophulariaceae (549)
Leaves either difficult to distinguish or all in a basal rosette 88. Lentibulariaceae (569)

133 Sepals intergrading with petals; stamens fused in a 'hood' around the stigma; stipules absent 34. Balsaminaceae (149)
Sepals never petaloid; stamens free from each other; stipules present 15. Violaceae (100)

134 One pair of sepals enlarged to enclose most of the flower 17. Polygalaceae (101)
All sepals more or less the same size, if distinguishable, or not enlarged **135**

135 Flowers in heads; sepals reduced to scales or a pappus of hairs 77. Compositae (416)
Flowers not in heads, or if so then sepals not reduced **136**

136 Ovary inferior; stamens joined round the style **137**
Ovary superior; stamens free or fused to petals only **138**

137 Anthers sessile around the style column and fused to it 7. Aristolochiaceae (84)
Stamens with filaments, only loosely coherent around the style 82. Campanulaceae (509)

138 Stamens 5 or fewer **139**
Stamens more than 5 **141**

139 Flower parts in twos or fours; filaments 2 11. Fumariaceae (88)
Flower parts in fives **140**

140 Ovules attached to the walls of the ovary 89. Gesneriaceae (571)
Ovules attached to the centre of the ovary 86. Scrophulariaceae (549)

141 Leaves without stipules; petals lobed 16. Resedaceae (100)
Leaves stipulate; petals entire or the uppermost slightly notched **142**

142 Petals and sepals 4 13. Capparaceae (90)
Petals and sepals 5 **143**

143 Stamen filaments joined in a tube 57. Papilionaceae (237)
Stamen filaments free 55. Caesalpiniaceae (230)

LEAVES ALTERNATE, SIMPLE; FLOWERS REGULAR

144 Plants climbing or scrambling **145**
Plants erect, unsupported **153**

145 Plants with tendrils or prickly stems **146**
Plants without tendrils, unarmed **148**

146 Leaves stipulate **147**
Leaves without stipules 43. Cucurbitaceae (166)

147 Tendrils paired at each node 105. Smilacaceae (700)
Tendrils single at each node 42. Passifloraceae (163)

148 Flowers in spikes or racemes **149**
Flowers in heads, cymes or solitary **151**

149 Flowers unisexual; perianth with 6 lobes 111. Dioscoreaceae (720)
Flowers bisexual; perianth with 5 lobes **150**

150 Plant woody with trailing shoots from a tuberous rootstock; flowers green 61. Icacinaceae (326)
Plant herbaceous with twining stems; flowers white 29. Basellaceae (139)

151 Flowers in heads, sessile 77. Compositae (416)
Flowers in cymes or solitary, mostly pedicellate **152**

152 Flowers unisexual; petals free 44. Begoniaceae (178)
Flowers bisexual; petals joined 85. Convolvulaceae (530)

153 Anthers fused in a tube around the style; flowers in a head 77. Compositae (416)
Flowers not in a head and/or with anthers not forming a tube around the style **154**

154 Flowers unisexual, with fertile anthers and no

ovary, or with style and stigma but no fertile anthers 155
Flowers bisexual with anthers and stigma 157

155 Leaves stipulate 156
Leaves without stipules 43. Cucurbitaceae (166)

156 Ovary inferior; stigma forked; stamens numerous 44. Begoniaceae (178)
Ovary superior; stigma entire; stamens 5 42. Passifloraceae (163)

157 Ovary inferior 158
Ovary superior 161

158 Plant fleshy; petals in more than one row 45. Cactaceae (180)
Plant not fleshy; petals in one row 159

159 Flowers in umbels or apparently in heads if sessile 68. Umbelliferae (348)
Flowers in racemes, spikes or solitary 160

160 Petals 4, free 36. Onagraceae (155)
Petals 5, joined 82. Campanulaceae (509)

161 Leaves stipulate 162
Leaves without stipules 169

162 Stipules forming a sheath around the stem above the node 25. Polygonaceae (122)
Stipules not forming a sheath 163

163 Stamens many, with filaments fused into a sheath around the style 51. Malvaceae (193)
Filaments free, or fused at base only, in bundles 164

164 Stamens 5 165
Stamens more than 5 168

165 Flowers with a corona of petaloid organs in one or more whorls together with the stamens 42. Passifloraceae (163)
Flowers without a corona 166

166 Stamens borne on a delicate cylinder which may bear staminodes between the filaments 50. Sterculiaceae (190)
Stamens free or borne on a central column in the flower 167

167 Leaves with sticky hairs which trap insects; stellate hairs absent 19. Droseraceae (109)
Leaves without glandular hairs; stellate hairs present 49. Tiliaceae (187)

168 Fruit with a long sterile beak 32. Geraniaceae (140)
Fruit a drupe or capsule, without a long sterile beak above 49. Tiliaceae (187)

169 Sepals 2, 3, or 4 170
Sepals 5 175

170 Sepals 3 171
Sepals 2 or 4 172

171 Petals 4–6 10. Papaveraceae (88)
Petals 3 95. Alismataceae (650)

172 Sepals 4 173
Sepals 2 174

173 Flowers crowded in a spike; petals joined in a tube at base; stamens 4 81. Plantaginaceae (508)
Flowers in racemes; petals free; stamens 6 14. Cruciferae (92)

174 Sepals caducous; petals 4–6 10. Papaveraceae (88)
Sepals persistent; petals 5 24. Portulacaceae (119)

175 Petals fused into a tube at least at base 176
Petals free from each other 185

176 Leaves needle-like 69. Ericaceae (362)
Leaves flat, broad, or fleshy 177

177 Ovary of 4–5 separate carpels, each with many ovules 18. Crassulaceae (104)
Ovary simple, or if lobed, then style single 178

178 Fruit of 4 hard nutlets 83. Boraginaceae (517)
Fruit a capsule or indehiscent, not divided into nutlets 179

179 Flowers in heads 180
Flowers in cymes or racemes 181

180 Stamens attached to perianth tube 40. Thymelaeaceae (159)
Stamens free 80. Plumbaginaceae (508)

181 Stamens opposite the petals 79. Primulaceae (505)
Stamens alternating with the petals 182

182 Perianth tube bearing petal-like lobes at its mouth 40. Thymelaeaceae (159)
Petals not borne on a perianth tube 183

183 Sepals free 85. Convolvulaceae (530)
Sepals fused at least at the base 184

184 Plants with a rosette of leaves and flowers on erect scapes with or without sterile bracts at base, or plants with creeping stems and leafless flowering stalks 86. Scrophulariaceae (549)
Plants with leafy, erect, or at least aerial stems 84. Solanaceae (523)

185 Ovary of free carpels 186
Ovary simple 187

186 Leaves fleshy 18. Crassulaceae (104)
Leaves not fleshy 3. Ranunculaceae (75)

187 Leaves with sticky glands which trap and hold insects 19. Droseraceae (109)
Leaves without sticky glands 188

188 Flowers blue, yellow or orange 189
Flowers pink, red or white 23. Aizoaceae (115)

189 Sepals forming a tube at base; ovary with 3 stigmas and parietal placentation 12. Turneraceae (89)
Sepals free; ovary with 4–5 stigmas and axile placentation 30. Linaceae (139)

PTERIDOPHYTES (FERNS AND FERN-ALLIES)†

SPOROPHYTES free-living, generally medium-sized (20–200 cm long), containing vascular tissue variously arranged, producing sporangia which contain spores; gametophytes free-living or rarely saprophytic, always small (less than 2 cm long) and generally inconspicuous (often passed over as liverworts), lacking vascular tissue, containing antheridia and/or archegonia.

The Pteridophytes do not constitute a single natural group of plants. They are therefore difficult to characterize in any meaningful way. The two subgroups, ferns and fern-allies, into which they are commonly divided, while not necessarily natural assemblages themselves, are much easier to delineate. Each is described below.

FERN-ALLIES (GENERA 1–4)

Stems usually elongate (except *Isoetes*), glabrous or occasionally hairy, never scaly; leaves numerous, simple, one-nerved, generally small (up to 2·5 cm long, except in *Isoetes*), sometimes with a small appendage called the ligule near the base on the upper (adaxial) side (*Selaginella, Isoetes*); sporangia solitary and borne in the axils of leaves termed sporophylls (*Lycopodium, Selaginella*), or solitary and sunken in the base of a sporophyll (*Isoetes*), or several and borne on the underside of umbrella-shaped sporangiophores (*Equisetum*); sporophylls and sporangiophores often grouped into cone-like strobili; sporangia, spores and gametophytes either of one kind (*Lycopodium, Equisetum*) or of two kinds (*Selaginella, Isoetes*).

FERNS (GENERA 5–67)

Stems (which are called rhizomes) usually densely to sparsely covered by scales and/or hairs; leaves (which are called fronds) several to many, simple or compound, with several to many veins; young fronds (of most ferns) uncurling at the apex, the hook-like tip being called a crozier or fiddlehead; sporangia borne on the lower (abaxial) surface or margins of the fronds, usually in distinctively shaped clusters called sori or, less commonly, completely covering the lower surface of the frond; sori uncovered, or covered by special structures called indusia, or covered by reflexed frond margins (false indusia); sporangia, spores and gametophytes generally of one kind (of two kinds in *Marsilea, Salvinia,* and *Azolla*).

Pteridophytes occur in almost all habitats but are most abundant in moist, montane forests, particularly along streams and rivers. Most species are shade-loving and many are epiphytic. Economically these plants are of no importance with the exception of the naturalized *Salvinia auriculata* which has become an important weed in Lake Naivasha. The cultivated *Nephrolepis cordifolia* and *Adiantum raddianum* have also become naturalized in places.

CLASSIFICATION OF THE PTERIDOPHYTES AND AN INDEX TO THE GENERA

As yet there is no general agreement among fern specialists as to family limits in certain groups of ferns. As a result of this and the necessity to use microscopic characters in distinguishing most families, a key to the families and family descriptions have been omitted. These may be found in any of the African fern floras cited below, the most generally useful in our area being Schelpe's 'Pteridophyta' in '*Flora Zambesiaca*'. Even the generic boundaries in some families, notably the Hymenophyllaceae and Thelypteridaceae, are still far from decided. An outline of the classification of the pteridophyte families and genera used in this book is given below.

FAMILY	GENERA	FAMILY	GENERA
1. Lycopodiaceae	1. *Lycopodium*	3. Isoetaceae	3. *Isoetes*
2. Selaginellaceae	2. *Selaginella*	4. Equisetaceae	4. *Equisetum*

† By R. B. Faden.

FAMILY	GENERA
5. Ophioglossaceae	5. *Ophioglossum*
6. Marattiaceae	6. *Marattia*
7. Osmundaceae	7. *Osmunda*
8. Schizaeaceae	8. *Anemia*
	9. *Mohria*
9. Gleicheniaceae	10. *Gleichenia*
	11. *Dicranopteris*
10. Hymenophyllaceae	12. *Hymenophyllum*
	13. *Trichomanes*
11. Dennstaediaceae	14. *Microlepia*
	15. *Hypolepis*
	16. *Pteridium*
	17. *Blotiella*
	18. *Histiopteris*
12. Adiantaceae	19. *Coniogramme*
	20. *Pityrogramma*
	21. *Anogramma*
	22. *Adiantum*
	23. *Pteris*
	24. *Notholaena*
	25. *Cheilanthes*
	26. *Doryopteris*
	27. *Pellaea*
	28. *Aspidotis*
	29. *Actiniopteris*
13. Davalliaceae	30. *Nephrolepis*
	31. *Arthropteris*
	32. *Oleandra*
	33. *Davallia*
14. Cyatheaceae	34. *Cyathea*
15. Aspidiaceae	35. *Didymochlaena*
	36. *Dryopteris*
	37. *Hypodematium*
	38. *Phanerophlebia*
	39. *Polystichum*
	40. *Arachniodes*
	41. *Ctenitis*
	42. *Tectaria*
16. Lomariopsidaceae	43. *Elaphoglossum*
	44. *Lomariopsis*
	45. *Bolbitis*
17. Thelypteridaceae	46a. *Macrothelypteris*
	46b. *Ampelopteris*
	46c. *Cyclosorus*
	46d. *Leptogramma*
	46e. *Thelypteris*
18. Athyriaceae	47. *Cystopteris*
	48. *Athyrium*
	49. *Diplazium*
	50. *Dryoathyrium*
19. Blechnaceae	51. *Blechnum*
20. Aspleniaceae	52. *Asplenium*
	53. *Ceterach*
21. Polypodiaceae	54. *Platycerium*
	55. *Pyrrosia*
	56. *Drynaria*
	57. *Loxogramme*
	58. *Phymatodes*
	59. *Pleopeltis*
	60. *Microsorium*
22. Grammitidaceae	61. *Grammitis*
	62. *Xiphopteris*
23. Vittariaceae	63. *Antrophyum*
	64. *Vittaria*
24. Marsileaceae	65. *Marsilea*
25. Salviniaceae	66. *Salvinia*
26. Azollaceae	67. *Azolla*

REFERENCES WHICH ARE USEFUL FOR IDENTIFYING PTERIDOPHYTES

ALSTON, A. H. G. (1959). *The ferns and fern-allies of west tropical Africa* (Suppl. to 2nd edn, FWTA). London. (Good keys but few illustrations.)

TARDIEU-BLOT, M.-L. (1953). Les ptéridophytes de l'Afrique intertropicale Française. *Mém. Inst. Fr. Afr. Noire* **28**, 1–241; (1957) **50**, 11–49. (Well illustrated but many of the names are out of date; the second part contains the aquatic ferns and the fern-allies and the whole volume in which it was published must be purchased.)

—— (1964). Ptéridophytes *in* Aubréville, A. (ed.), *Flore du Cameroun.* Paris. (Well illustrated but lacks many of our species.)

—— (1964). Ptéridophytes *in* Aubréville, A. (ed.) *Flore du Gabon.* Paris. (Well illustrated, many of

the plates being the same as in the above two works, but shorter and generally less useful than the previous book.)

SCHELPE, E. A. C. L. E. (1969). Reviews of Tropical African Pteridophyta. 1. *Contrib. Bolus Herb.* **1**, 1-132. (No illustrations; contains the families Grammitidaceae, Azollaceae, Salviniaceae, Vittariaceae, Lomariopsidaceae, Adiantaceae, Polypodiaceae.)

—— (1970). Pteridophyta *in* Exell, A. W. and Launert E. (ed.), *Flora Zambesiaca.* London. (Well illustrated; the most useful published work for our area.)

GLOSSARY

acroscopic: on the side towards the apex.

anastomosis (*pl.* **anastomoses**): the joining of vein branches, usually to form a reticulate venation.

antheridium (*pl.* **antheridia**): the male reproductive organ which contains male gametes; produced by the gametophyte.

archegonium (*pl.* **archegonia**): the female reproductive organ which contains a single female gamete; produced by the gametophyte.

areole: a portion of the lamina, usually polygonal in shape, completely surrounded by veinlets, in a reticulate venation.

basiscopic: on the side towards the base.

clathrate: having the appearance of a lattice; said of scales in which the peripheral walls of the cells are thick and opaque while the central part (lumen) is thin and transparent.

coenosorus: a sorus formed by the confluence of smaller sori.

costa (*pl.* **costae**): the midvein of a pinna.

costule: the midvein of a pinnule, a branch of a costa.

crozier: the hook-like apex of a young fern frond.

decompound: several times compound.

dichotomous: repeatedly dividing into two equal parts.

dimidiate: said of pinnae in which the costae run along the basiscopic margin for some distance, the costae thus dividing the pinnae into very unequal parts.

exindusiate: lacking an indusium.

frond: the leaf of a fern.

gametophyte: the generation which bears the sexual organs (antheridia and archegonia in pteridophytes).

gemma (*pl.* **gemmae**): an asexual bud produced on a fern frond which gives rise to a new plant.

hydathode: a dot-like pore in leaves through which water is exuded.

indusiate: having an indusium.

indusium (*pl.* **indusia**): an outgrowth of the lower epidermis in ferns which covers the sorus. The reflexed margin which covers the sori in some ferns is called a 'false indusium'.

lamina (*pl.* **laminae**): the blade or expanded green portion of a leaf.

ligulate: having a ligule.

ligule: a small appendage borne on the adaxial surface near the base of a leaf in *Selaginella* and *Isoetes*.

lumina (*sing.* **lumen**): the transparent, window-like areas of the cells in clathrate scales.

megasporangium: a sporangium which contains megaspores.

megaspore: when two types of spores are produced, the larger of the two. This gives rise to a female gametophyte.

microsporangium: a sporangium which contains microspores.

microspore: when two types of spores are produced, the smaller of the two. This gives rise to a male gametophyte.

palea (*pl.* **paleae**): the scales which are frequently found on fern rhizomes and fronds.

paleate: having paleae.

palmate; palmately compound: said of a lamina which is divided to the base into segments which are attached at one point.

palmatifid: similar to palmate but the segments joined near their bases.

paraphysis (*pl.* **paraphyses**): a sterile stalk produced among the sporangia in a sorus.

phyllopodium (*pl.* **phyllopodia**): a peg-like structure which is left attached to the rhizome in some ferns when the frond falls off. This is the persistent stipe base.

pinna (*pl.* **pinnae**): the primary division of a compound frond; a leaflet of a frond.

pinnate; pinnately compound: said of a lamina which is divided to the midvein into segments (pinnae) which are arranged like the barbs of a feather. The midvein in such a leaf is called a rachis.

pinnate-pinnatifid: when used in this way, terms such as these are not averaged but are additive. A frond which is pinnate-pinnatifid has the lamina pinnate with pinnatifid pinnae.

pinnatifid: similar to pinnate but the segments joined near their bases.

pinnule: a division of a pinna.

rachis: the midvein of the lamina in a compound leaf; the continuation of the petiole in a com-

pound leaf or frond to which the leaflets or pinnae are attached.

reticulate: forming a network.

rhizophore: a white, root-like branch in *Selaginella* which arises from a fork of two leafy shoots. The rhizophore produces roots.

segment: in a highly dissected frond, the smallest division of the lamina. When small pinnules are very similar to the lobes of larger pinnules, the term segment refers to both of these.

sinus: the space between two adjacent lobes of the lamina.

soboliferous: bearing soboles, which are sprouting shoots that arise just above the base of a stem and grow horizontally. They are slender, have reduced leaves and long internodes, and give rise to new plants vegetatively.

sorus (*pl.* **sori**): a cluster of sporangia on a fern frond.

sporangiophore: an umbrella-shaped structure in *Equisetum* which bears sporangia on its underside. The cap is hexagonal in outline.

sporangium (*pl.* **sporangia**): the case or sac which contains the spores. Sporangia vary in size from barely visible to several millimetres in length.

sporocarp: the structure in *Marsilea, Salvinia*, and *Azolla* which contains the sori and sporangia.

sporophyll: a leaf or modified leaf which bears one or more sporangia on its base or in its axil.

sporophyte: the generation which produces spores asexually.

stipe: the petiole of a fern frond.

strobilus (*pl.* **strobili**): a dense, cone-like cluster of sporangium-bearing structures (sporophylls or sporangiophores).

synangium (*pl.* **synangia**): a structure in *Marattia* composed of laterally fused sporangia.

vascular bundle; strand: a collection of water- and food-conducting tissue (xylem and phloem). A vascular bundle is circular or elliptic in cross-section while a vascular strand is oblong, linear or variously shaped, but not circular or elliptic.

velum: a flap of tissue on the sporophyll in some species of *Isoetes* which partially or completely covers the sporangium.

USING THE KEYS

The keys are intended for use in the field with living plants. Therefore microscopic characters have been omitted. A 10x or 20x lens and a sharp knife (for making cross-sections of stipes) are essential however. A familiarity with the use of keys and a general knowledge of the more common botanical terms ar assumed. There are however a number of terms which are used primarily or exclusively for pteridophyte or are used in a different sense for these plants than they are for flowering plants. For this reason a shor glossary has been included.

WHAT TO LOOK FOR BEFORE ATTEMPTING TO KEY OUT A FERN

Rhizome: Is it erect or creeping? Is it covered with hairs and/or scales? Are the scales clathrate o not?

Fronds: Are the fronds simple or compound? Is the venation free or reticulate? Are the fertile an sterile fronds (or pinnae) uniform or dimorphic? Are the stipes or pinnae articulated at or near the bases?

Stipe: What are the shape and arrangement of the vascular bundles or strands in a cross-section (n easily determined in small fronds)?

Sporangia and sori: Are the sporangia in sori? What is the shape of the sorus? Are the sori in an distinctive position, e.g. marginal, submarginal? Is there an indusium? A false indusium?

1 Aquatic plants — 2
Terrestrial or epiphytic plants — 9

2 Plants floating — 3
Plants rooted — 4

3 Leaves in whorls of 3, the upper 2 entire and usually more than 1 cm long, the lower one submersed and divided into numerous roo like segments
66. *Salvinia auricula*

Leaves alternate, less than 0·3 cm long, ea with a floating green (sometimes tinged wi red) lobe and a submersed colourless lobe
67. *Azo*

4 Leaves grass-like, each with 4 longitudinal air channels; sporangia sunken in the swollen, fleshy basal part of the leaf — 3. *Isoetes*
Leaves not grass-like; sporangia not sunken in the basal part of the leaf — 5

5 Stems jointed; leaves simple, sessile, whorled, less than 1 cm long, fused laterally into a tube-like sheath; sporangia in terminal strobili — 4. *Equisetum ramosissimum*
Stems not jointed; leaves (fronds) compound, petiolate (stipitate), alternate or spirally arranged, more than 3 cm long; sporangia not in strobili — 6

6 Fronds with 4 obdeltoid to obovate pinnae clustered at the summit of the stipe; sporangia in seed-like sporocarps arising from the rhizome or the bases of the stipes — 65. *Marsilea*
Fronds pinnate to bipinnate; sporangia on the fronds — 7

7 Fronds bipinnate; fertile pinnae without a lamina, bearing clusters of large sporangia; stipe with one vascular strand — 7. *Osmunda regalis*
Fronds pinnate or bipinnatifid; fertile pinnae with a lamina, bearing small sporangia; stipes with 2-several vascular bundles or strands at least at the base — 8

8 Fronds leathery; sporangia completely covering the underside of the fertile fronds; stipes with several vascular bundles arranged in a U-shape — 45. *Bolbitis heudelotii*
Fronds not leathery; sporangia in round sori; stipes with 2 C-shaped vascular strands at the base, uniting above to form a single U-shaped strand — 46. *Thelypteris* Group

9 Leaves up to 2 cm long, if longer, then grass-like, usually numerous, each with a single vein; sporangia axillary or sunken in the swollen base of the leaf, or borne on the underside of umbrella-shaped sporangiophores in terminal strobili — 10
Leaves (fronds) larger, usually few, never grass-like, each with several to many veins; sporangia borne on the undersides or margins of the leaves — 14

10 Leaves whorled, fused laterally into a tube-like sheath; stems jointed and grooved; sporangia borne on the undersides of umbrella-shaped sporangiophores in terminal strobili — 4. *Equisetum ramosissimum*
Leaves spirally arranged, free; stems neither jointed nor grooved; sporangia axillary or sunken in the base of the leaf — 11

11 Stems not elongate; leaves grass-like, more than 3 cm long — 3. *Isoetes*
Stems elongate; leaves not grass-like, less than 2·5 cm long — 12

12 Vegetative leaves dimorphic, arranged in 4 ranks — 2. *Selaginella*
Vegetative leaves uniform, arranged in 6–many ranks or not obviously in ranks — 13

13 Sporangia and spores of two kinds; leaves ligulate; plants of rock crevices — 2. *Selaginella*
Sporangia and spores uniform; leaves not ligulate; plants of various habitats but not of rock crevices — 1. *Lycopodium*

14 Stem erect, woody, 1–10 m tall; fronds 1–3·5 m long; tree ferns — 34. *Cyathea*
Stem (rhizome) various, if erect then less than 1 m tall; frond length various but usually less than 2 m (except *Marattia*) — 15

15 Undersurface of frond densely covered with white or brown matted hairs or with brown or whitish stellate scales which obscure the surface in places (if surface obscured by dense, lanceolate, clathrate scales, see 53. *Ceterach cordatum*) — 16
Undersurface of frond hairy or glabrous, but the surface clearly visible — 18

16 Undersurface of frond covered with white or brown matted hairs; plants terrestrial — 24. *Notholaena inaequalis*
Undersurface of frond covered with stellate scales; plants usually epiphytic — 17

17 Fronds tufted, completely hiding the rhizome, strongly dimorphic, up to 100 cm long and 50 cm wide (often much less in herbarium specimens); fertile frond obovate-cuneate — 54. *Platycerium angolense*
Fronds widely spaced on a thin, long-creeping rhizome, uniform, lanceolate to oblanceolate, up to 30 cm long and 2·5 cm wide — 55. *Pyrrosia schimperana*

18 Undersurface of frond covered with white or orange powder — 19
Undersurface green — 20

19 Undersurface with white powder — 25. *Cheilanthes*
Undersurface with orange powder — 20. *Pityrogramma aurantiaca*

20 Fertile fronds simple, unlobed, or lobed less than halfway to the midvein, or if more deeply lobed then fronds up to 0·5 cm wide — 21
Fertile fronds compound to decompound, or

simple and lobed more than halfway to the midvein and fronds more than 0·5 cm wide 32

21 Fronds dimorphic, the fertile ones long stipitate, without a lamina, bearing two rows of large sporangia near the apex, the stipe attached to the stipe or lamina of the sterile frond; rhizome erect 5. *Ophioglossum*

Fronds uniform or occasionally dimorphic, the fertile one always with a lamina; sporangia either covering the undersurface of the fertile frond or else in sori; fertile frond always separate from the sterile frond (if fronds dimorphic); rhizome creeping to erect 22

22 Sporangia completely covering the underside of the fertile fronds; stipes articulated a short distance above the rhizome 43. *Elaphoglossum*

Sporangia in sori; stipes not articulated or articulated at the rhizome, rarely a short distance above the rhizome (*Oleandra, Microsorium*) 23

23 Fronds one cell layer thick, often shallowly lobed; sori marginal; indusium conical 13. *Trichomanes erosum*

Fronds thicker, unlobed (except *Xiphopteris* and a form of *Pleopeltis macrocarpa*); sori not marginal; indusium absent or, if present, then not conical 24

24 Sori elongate 25

Sori round to elliptic or more or less confluent in the upper part of the frond 28

25 Indusium present; venation free 52. *Asplenium* sp. *A*

Indusium absent; venation reticulate 26

26 Fronds linear, less than 0·5 cm wide; sori 2, parallel to and just within the margin 64. *Vittaria volkensii*

Fronds lanceolate to ovate, more than 1 cm wide; sori few–numerous, not parallel to the margin 27

27 Stipe longer than the blade; blade ovate; sori forking and frequently anastomosing; venation prominent 63. *Antrophyum mannianum*

Stipe much shorter than the blade; blade lanceolate; sori separate; venation not prominent 57. *Loxogramme lanceolata*

28 Indusium present; veins free and mostly forked; rhizome often free from the substrate for much of its length, often pendent 32. *Oleandra distenta*

Indusium absent; venation reticulate or free; rhizome firmly attached to the substrate, never pendent 29

29 Venation free; fronds up to 7 cm long and 0·5 cm wide, tufted on an erect rhizome 30

Venation reticulate; fronds at least 8 cm long and 1 cm wide, tufted on a short-creeping rhizome or widely spaced on a long-creeping rhizome 31

30 Fronds lobed, at least in the lower part, the upper, sori-bearing part being serrate to entire 62. *Xiphopteris*

Fronds entire 61. *Grammitis* sp. *A*

31 Sori in one row on each side of and parallel to the midvein; fronds up to 30 cm long and 2·5 cm wide 59. *Pleopeltis*

Sori numerous and scattered; fronds 60–100 cm long and 4–6 cm wide 60. *Microsorium punctatum*

32 Rachis or lamina dichotomously branched or divided 33

Rachis and lamina palmately or pinnately branched or divided 34

33 Rachis absent; lamina dichotomously divided, fan-shaped or wedge-shaped; fronds of determinate growth, without buds, up to 30 cm long; sori elongate; plants of rock crevices 29. *Actiniopteris*

Rachis dichotomously branched, the segments without a lamina or with a deeply pinnatifid lamina; fronds with continuous growth, with buds, sometimes 100 cm long or longer; sori round; plants of disturbed ground, e.g. roadside banks 11. *Dicranopteris linearis*

34 Fronds pinnatifid to pinnate, the pinnae sometimes lobed or toothed 35

Fronds palmatifid or bipinnatifid to decompound 48

35 Sporangia covering the entire lower surface of the fertile frond 36

Sporangia in sori 37

36 Venation free 44. *Lomariopsis warneckei*

Venation reticulate 45. *Bolbitis heudelotii*

37 Sori marginal or submarginal, usually covered by the reflexed margin 38

Sori medial to subcostal or rarely submarginal 40

38 Fronds lacking a terminal pinna, often rooting at the apex; pinnae trapezoidal; young fronds often reddish; sori borne on the inner faces of reflexed marginal lobes 22. *Adiantum incisum*

Fronds with a terminal pinna similar to the lateral pinnae, never rooting at the apex; pinnae lanceolate to elliptic or oblong; young fronds green; sori borne on the lamina beneath the reflexed margins 39

39 Fronds glabrous; stipes reddish or straw-coloured 23. *Pteris*
Fronds hairy or glabrous; stipes shiny black to reddish-brown 27. *Pellaea*

40 Sori elongate 41
Sori round to elliptic or semilunar 44

41 Indusium absent 42
Indusium present 43

42 Fronds pinnatifid, to 15 cm long, tufted on the rhizome, densely covered with lanceolate, clathrate scales on the lower surface; plants of banks and rock crevices, not usually associated with water 53. *Ceterach cordatum*
Fronds pinnate to bipinnate, 50–150 cm long, spaced on the rhizome, without scales on the lower surface; plants of stream banks and the vicinity of waterfalls 19. *Coniogramme africana*

43 Pinnae uniform; margins usually toothed, rarely revolute; sori at an angle to the costa; scales clathrate 52. *Asplenium*
Fertile pinnae usually much narrower than the sterile pinnae; margins revolute, usually entire; sori parallel to the costa and usually more or less confluent, forming one long coenosorus on both sides; scales not clathrate 51. *Blechnum*

44 Indusium present; fronds pinnate, the pinnae stalked or narrowly attached to the rachis 45
Indusium absent; fronds pinnatifid or if pinnate then pinnae broadly attached to the rachis and their bases contiguous 46

45 Pinnae articulated; veins free; indusium reniform; sori in 2 submarginal rows on each pinna 30. *Nephrolepis*
Pinnae not articulated; venation reticulate; indusium peltate; sori in many rows or irregularly scattered on the pinnae 38. *Phanerophlebia caryotidea*

46 Fronds 0·5–2 cm wide; venation free (usually obscure) 62. *Xiphopteris flabelliformis*
Fronds 10–30 cm wide; venation reticulate 47

47 Fronds dimorphic, the fertile ones large and stipitate, texture herbaceous, the sterile ones much smaller and sessile, texture ± coriaceous; pinnae with 2 rows of subcostal sori 56. *Drynaria volkensii*
Fronds uniform, stipitate, slightly fleshy; pinnae with 4–6 (rarely 2) rows of sori 58. *Phymatodes scolopendria*

48 Fronds with buds at the bases of the pinnae 10. *Gleichenia elongata*
Fronds without buds at the bases of the pinnae 49

49 Fronds strongly dimorphic, the fertile fronds or pinnae without a lamina 50
Fronds not at all to rarely slightly dimorphic, the fertile fronds always with a lamina 51

50 Fronds bipinnate, glabrous; rhizome erect; plants usually growing near water 7. *Osmunda regalis*
Fronds pinnate, the lower pinnae bipinnatifid, hairy; rhizome shortly creeping; plants of dry situations 8. *Anemia schimperana*

51 Sporangia covering the lower surface of the fertile fronds; fronds pinnate with pinnatifid pinnae, fleshy, glabrous; venation reticulate; plants usually growing on rocks in rivers 45. *Bolbitis heudelotii*
Sporangia in sori; cutting of frond and texture various; venation free or reticulate; fronds glabrous or hairy; plants of various habitats 52

52 Sporangia large and united into elliptic synangia which are borne in two submarginal rows on each pinnule; stipules present at the base of the stipe; fronds bipinnate, fleshy, to 3 m long 6. *Marattia fraxinea*
Sporangia separate or too small to be readily seen without a lens; stipules absent; frond cutting and texture various; size various 53

53 Sori marginal; indusium cup-shaped to conical or tubular 54
Sori marginal or not, if marginal then indusium absent, or if present, then not cup-shaped to conical or tubular 57

54 Fronds one cell layer thick (except *Trichomanes radicans*); rhizome and often fronds hairy, without scales 55
Fronds thicker; rhizome scaly, without hairs; fronds glabrous but often with scales 56

55 Indusium cup-shaped, 2-lipped, the lips ± equalling the cup-shaped part in length 12. *Hymenophyllum*
Indusium conical or tubular, usually broadened at the apex but not 2-lipped (except *T.* sp. *A*) 13. *Trichomanes*

56 Rhizome long-creeping; fronds spaced; stipes

articulated a short distance above the rhizome; indusium with horn-like projections of the lamina on both sides; scales not clathrate 33. *Davallia chaerophylloides*

Rhizome ± erect; fronds ± tufted; stripes not articulated; indusium with a horn-like projection on one side or without horn-like projections; scales clathrate 52. *Asplenium*

57 Stipes jointed; fronds pinnate; pinnae deeply pinnatifid, articulated to the rachis; rhizome rampant with widely spaced fronds; upper surface of frond often with white calcareous nodules along the margin; sori round 31. *Arthropteris*

Stipes not jointed; frond cutting various; pinnae not articulated (sometimes the pinnules are articulated); rhizome rampant to erect; calcareous nodules absent; sori various 58

58 Sporangia large (about 0·5 mm in diameter), easily seen with the unaided eye, marginal or submarginal and often protected by reflexed marginal lobes; indusium absent; fronds narrowly lanceolate to narrowly elliptic, to 40 cm long, tufted on a short-creeping rhizome; rachis densely scaly and hairy 9. *Mohria caffrorum*

Sporangia small (usually less than 0·2 mm in diameter); frond shape, length, and arrangement on rhizome various; indusium present or absent; rachis glabrous or hairy or scaly, rarely hairs mixed with scales 59

59 Rhizome hairy on young parts (hairs mixed with scales in *Histiopteris*), often rampant with spaced fronds (short with tufted fronds in *Blotiella*), sometimes deeply buried; fronds hairy (except *Histiopteris*), without scales, 1–3 m long (occasionally less in dwarfed forms of *Hypolepis rugosula*); sori marginal or submarginal 60

Rhizome scaly on young parts, rarely rampant, never deeply buried; fronds glabrous or hairy, with or without scales; size various; sori various 64

60 Fronds glabrous, often glaucous beneath; pinnae with basal pair of pinnules usually reduced and stipule-like; rhizome covered with hairs and scales 18. *Histiopteris incisa*

Fronds hairy; basal pair of pinnules rarely stipule-like (sometimes so in *Pteridium*); rhizome covered with hairs only 61

61 Rhizome thick, woody, densely covered with long, shaggy, red or golden hairs; fronds tufted; venation reticulate 17. *Blotiella*

Rhizome thin, herbaceous, sparsely hairy; fronds spaced; venation free 62

62 Sori marginal, very elongate; texture coriaceous; vascular bundles and strands in the stipe numerous and arranged in an irregular pattern 16. *Pteridium aquilinum*

Sori submarginal to marginal, round to ovate or elliptic; texture membranaceous, sometimes firmly so; vascular strands 1–several, arrangement in a U-shape 63

63 Indusium cup-shaped, opening outwards 14. *Microlepia speluncae*

Indusium absent, but sori often covered by reflexed marginal lobes 15. *Hypolepis*

64 Pinnules wedge-shaped, fan-shaped or trapezoidal; all pinnules stalked; sori borne on reflexed marginal flaps 22. *Adiantum*

Pinnules variously shaped but seldom any of the above shapes; at least the ultimate pinnules usually sessile; sori borne on the lamina, sometimes covered by the reflexed margins 65

65 Stipes with a single vascular strand, often wiry and shiny reddish-brown to black; sori either submarginal and without a true indusium but covered by reflexed margins, or else elongate on the veins and frequently forking 66

Stipes with 2–many vascular bundles or strands *near the base*, uslly green to dull brown; sori with or without an indusium, neither covered by reflexed margins nor forking 72

66 Sori elongate along the vein, often forking 67

Sori submarginal and covered by the reflexed margins 68

67 Rhizome erect; fronds tufted, up to 15 cm long 21. *Anogramma leptophylla*

Rhizome rampant; fronds spaced, 50–150 cm long 19. *Coniogramme africana*

68 Blade deltoid, tri- to quadripinnatifid 26. *Doryopteris*

Blade variously shaped, seldom deltoid, bi- to tripinnate 69

69 Sori interrupted along the margin, not more than twice as long as wide 70

Sori ± continuous along the margin, often at least 5 times longer than wide 71

70 Fronds glabrous, ovate-deltoid; marginal teeth pointed; sori covered by thin, scarious, reflexed marginal lobes very distinct in texture from the lamina; recorded only from Kacheliba 28. *Aspidotis schimperi*

Fronds glabrous or hairy, variously shaped but if ovate-deltoid, then hairy; marginal teeth rounded; sori covered by reflexed marginal lobes similar in texture to the rest of the lamina; widespread 25. *Cheilanthes*

71 Fronds up to 50 cm long; stipes shiny reddish-brown to black 27. *Pellaea*
Fronds 40–200 cm long; stipes green to dull brown or rarely reddish or castaneous 23. *Pteris*

72 Vascular bundles near the base of the stipe several–many, arranged in a U-shape 73
Vascular strands near the base of the stipe 2, each usually C-shaped 79

73 Sori elliptic; pinnules trapezoidal and articulated 35. *Didymochlaena truncatula*
Sori round; pinnules neither trapezoidal nor articulated 74

74 Venation reticulate; gemmae often present 42. *Tectaria gemmifera*
Venation free; gemmae rarely present (present only in *Dryopteris manniana*, *Polystichum volkensii* and *P. magnificum*) 75

75 Fronds pinnate, the pinnae deeply pinnatifid into oblong pinnules; margins entire or crenulate; rachis and costae densely and finely pubescent above 41. *Ctenitis cirrhosa*
Fronds bi- to quadripinnate; margins serrate to dentate, rarely crenulate; rachis and costae glabrous or pubescent above 76

76 Fronds lanceolate to elliptic; rachis and stipe densely scaly and hairy; indusium round, peltate; marginal teeth often ending in bristles 39. *Polystichum*
Fronds deltoid to ovate or ovate-lanceolate, rarely lanceolate; rachis and stipe sparsely to densely hairy or scaly; indusium, if present, round-reniform; marginal teeth rarely ending in bristles 77

77 Frond axes densely hairy; texture membranaceous; marginal teeth rounded, indusium with a few long hairs 41. *Ctenitis lanuginosa*
Frond axes glabrous or sparsely hairy, sometimes with numerous narrow scales; texture herbaceous, rarely membranaceous; marginal teeth rounded or pointed; indusium, if present, glabrous 78

78 Fronds deltoid to ovate; basal pair of pinnae usually much larger than the other pinnae; upper basal pinnule much larger than the other pinnules on the upper side of the pinna; marginal teeth terminating in a short bristle 40. *Arachniodes foliosa*
Fronds ovate-lanceolate to deltoid; basal pair of pinnae only slightly larger than the pinna pair above, or more commonly, slightly smaller than the next 1 or 2 pinna pairs; upper basal pinnule ± equal in size to the next pinnule on the upper side of the pinna; marginal teeth rounded or pointed, rarely terminating in a short bristle 36. *Dryopteris*

79 Vascular strands joining in the stipe to form a single X-shaped strand; sori elliptic to linear; scales clathrate 80
Vascular strands joining to form a single U-shaped strand; sori variously shaped; scales not clathrate 81

80 Indusium present; sori usually easily seen 52. *Asplenium*
Indusium absent; sori often covered by dense scales 53. *Ceterach cordatum*

81 Sori elongate, submarginal and covered by the reflexed margins 23. *Pteris cretica*
Sori variously shaped, rarely submarginal, not covered by reflexed margins 82

82 Fronds ovate-deltoid, densely and finely pubescent on both surfaces, lacking scales except at the base of the stipe; indusium large, persistent, broadly reniform, pubescent; recorded only from south Nyanza 37. *Hypodematium crenatum*
Frond shape and pubescence various; scales present or absent; indusium variously shaped, rarely reniform, hairy or glabrous, persistent or caducous; widespread 83

83 Costae grooved above or not grooved, if grooved, the groove not continuous with the groove of the rachis; rhizome scales often ciliate; sori round or rarely oblong-elliptic; indusium, if present, round-reniform and attached at the sinus 46. *Thelypteris* Group
Costae always grooved above, the groove continuous with the groove of the rachis; rhizome scales not ciliate; sori round, elliptic to linear, J-shaped or horseshoe shaped; indusium present, cup-shaped, elliptic to linear, J-shaped or horseshoe shaped, rarely round-reniform 84

84 Sori ± round or ovate 85
Sori elliptic to linear or J-shaped or horseshoe shaped 86

85 Fronds 100–150 cm long; pinnules of middle pinnae 4·5–7 cm long; indusium round-reniform 50. *Dryoathyrium boryanum*

Fronds 10–30 cm long; pinnules of middle pinnae 0·5–2 cm long; indusium cup-shaped 47. *Cystopteris fragilis*

86 At least some sori J-shaped or horseshoe shaped, the distal end crossing the veinlet to which the sorus is attached 48. *Athyrium*
Sori all elliptic to linear, never crossing the veinlet 49. *Diplazium*

1. LYCOPODIUM *L.*

Small to large, terrestrial or epiphytic herbs; roots adventitious; stems erect, prostrate or pendent, sometimes rhizomatous, covered with numerous, small, spirally-arranged, 1-nerved leaves; ligules absent; sporophylls uniform, similar to the vegetative leaves or strongly differentiated from them, sometimes arranged in strobili; sporangia large, reniform or globose, solitary in the axils of the sporophylls, dehiscent longitudinally into two valves.

1 Plants terrestrial with long, trailing stems or rhizomes, producing upright branches; sporophylls in strobili abruptly distinct from the vegetative shoot and often stalked (sessile in *L. cernuum*); leaves less than 1 mm broad **2**
Plants terrestrial and erect (moorland plants) or pendent and epiphytic; sporophylls not in distinct strobili, or if so, then these not stalked; leaves more than 1 mm wide (except *L. verticillatum*) **4**

2 Strobili sessile, up to 10 mm long and 3 mm wide, borne on the lateral branches of the upright shoots 1. *L. cernuum*
Strobili stalked, 20–50 (rarely to 80) mm long and 5–7 mm wide, terminal on the upright shoots **3**

3 Upright branches uniformly leafy until the junction with the rhizome; leaves ending in a bristle; sporophylls lanceolate-ovate to ovate 2. *L. clavatum*
Upright branches nearly leafless for a short distance from the junction with the rhizome; leaves acuminate but not ending in a bristle; sporophylls lanceolate 3. *L. aberdaricum*

4 Sporophylls in 4 ranks, decussate, strongly differentiated from the vegetative leaves; vegetative leaves tapered at both ends, elliptic to lanceolate-elliptic or, less commonly, lanceolate 4. *L. ophioglossoides*
Sporophylls in 6 or more ranks, or the ranks not easily counted; sporophylls strongly, or weakly or not at all differentiated from the vegetative leaves; leaves broadest at or just above the base, linear-lanceolate to lanceolate **5**

5 Leaves less than 10 mm long and 1 mm wide; sporangia up to 1 mm wide 5. *L. verticillatum*
Some or all leaves more than 10 mm long and 1 mm wide; sporangia 1·5–2 mm wide **6**

6 Sporophylls not differentiated from the vegetative leaves; sporophylls arranged in many ill-defined ranks; leaf apex acute or acuminate; plants terrestrial, erect, occurring in moorland 6. *L. saururus*
Sporophylls gradually reduced in size from the vegetative leaves; sporophylls arranged in 6 or 8 usually distinct ranks; leaf apex attenuate; plants epiphytic, pendent, occurring in forest 7. *L. dacrydioides*

1. Lycopodium cernuum *L.*

A herb with Christmas-tree-like upright shoots with a main axis and drooping lateral branches.

This is a plant of disturbed ground such as roadsides, and usually grows in full sun, 4000–8000 ft. It may also occur at swamp edges and is often associated with the fern *Dicranopteris linearis.* HM, HA, HN, NAR, RV, EMB, MAC, NBI. Also in the Taita hills.

Greenway 13814; Glover and Samuel 3345.

2. Lycopodium clavatum *L.*

Upright shoots with ascending branches and often lacking a main axis.

This species occurs in high-altitude forests, often in the bamboo zone, and is frequent on roadside banks at the forest edge, occurring 6500–9250 ft. HE, HC, HT, HM, HA, HK, KIS. Also in the Taita hills.

Napper 665; Bally 4803.

3. Lycopodium aberdaricum *Chiov.*

The nearly leafless base of the upright shoots suggests a subterranean rhizome which would be unique among African species of *Lycopodium.*

The type and sole collection is from the Aberdares (Kinangop). HA.

Balbo 475.

4. Lycopodium ophioglossoides *Lam.*

A pendent epiphyte, when fully developed bearing dichotomously branched strobili which are often interrupted by small groups of vegetative leaves.

A plant of high-altitude wet forest, 5000–8200 ft. HC, HM, HA, HK, KIS. Also in the Taita hills.

Faden 69/092; Bally 4804.

5. Lycopodium verticillatum *L.f.*

A pendent epiphyte 20–180 cm long with filiform leaves.

This is another high-altitude, wet-forest plant. HA, HK. Also in the Taita hills.

Balbo 819; Faden 71/91.

6. Lycopodium saururus *Lam.*

A somewhat succulent herb with numerous, densely tufted, rigidly erect shoots with incurved thick leaves.

A characteristic moorland species, 8300–15 100 ft, it also occurs less commonly in more shaded habitats in the ericaceous zone. HE, HC, HA, HK.

Hedberg 1627; Faden 70/113.

7. Lycopodium dacrydioides *Bak.*

As broadly interpreted here, a very variable species in which the vegetative leaves are narrowly lanceolate and often somewhat falcate and pass gradually into the shorter and relatively broader sporophylls.

A forest species occurring 5000–9300 ft. HT, HM, HA, HK, KIT, MUM, KAJ. Also in the Taita and Sagala hills and on Mt. Kasigau.

Bally 4855; Mainwaring 2503.

2. SELAGINELLA *Beauv.*

Terrestrial herbs with rhizophores; stems erect to prostrate, sometimes soboliferous, with numerous, small, 1-veined leaves; leaves ligulate, spirally arranged, either uniform and not clearly arranged in ranks or dimorphic and distinctly 4-ranked; sporophylls distinct from the vegetative leaves, 4-ranked (in our species), uniform or dimorphic, arranged in terminal strobili; sporangia dimorphic, the megasporangia and microsporangia solitary in the axils of the sporophylls, usually both kinds present in the strobilus, sporangia dehiscent into two valves; spores dimorphic, the megaspores borne in the larger megasporangia and the microspores in the smaller microsporangia.

1 Leaves uniform, linear lanceolate, not in obvious ranks — 2
Leaves dimorphic, 4-ranked, the lateral ones elliptic to oblong — 3
2 Branches dorsiventral; megaspores densely reticulate — 1. *S. caffrorum*
Branches not dorsiventral; megaspores faintly rugose — 2. *S. phillipsiana*
3 Leaf margin white, long-ciliate; branches recurved when dry; plants of dry situations — 3. *S. yemensis*
Leaf margin green, denticulate to ciliolate; branches not recurved; plants of wet situations — 4
4 Plants usually frond-like, soboliferous; rhizophores produced only at the base; median leaves ending in a bristle; sporophylls dimorphic — 4. *S. abyssinica*
Plants not frond-like, not soboliferous, usually forming a carpet on the forest floor; rhizophores produced along the length of the stem; median leaves attenuate at the apex, not ending in a bristle; sporophylls uniform — 5. *S. kraussiana*

1. Selaginella caffrorum (*Milde*) *Hieron.*

A mat-forming species with branches strongly incurved when dry.

A plant of frequently-moist rock crevices at moderate altitudes (4750–7500 ft). HC, HT, KIT, RV, MAC. Also at Maralal and in the Taita hills.

Agnew 10089; Faden and Evans 69/169.

2. Selaginella phillipsiana (*Hieron.*) *Alston*

A mat-forming species in which the leaves have long white tips.

This grows in rock crevices in generally drier situations than *S. caffrorum* and the two never occur together (3000–6850 ft). BAR, RV, KAJ. Common in northern Kenya. The somewhat similar-looking species in the Tsavo area is *S. dregei* (Presl) Hieron.

Verdcourt, Napper, Glover, and Oledonet 4161; Faden 70/864.

3. Selaginella yemensis *Decne*

This is the only dry-rock-crevice species (in our area) with dimorphic leaves.

This plant is known in Kenya only from the Kabarnet Escarpment, 5000–6000 ft. BAR.

Tweedie 2276; Faden 70/861.

4. Selaginella abyssinica *Spring*

Unlike the other forest species *S. kraussiana*, this does not form a continuous carpet, but colonies consist of many individual, frond-like plants.

Found in wet forests or, less commonly, moist thickets, usually occurring on rocks or banks, 4000–8000 ft. HE, HC, HM, HK, KIT, MUM, KIS, NAR, MAC. Also on Mt. Kasigau.

Faden 67/579; Greenway 9554.

5. Selaginella kraussiana (*Kunze*) *A. Br.*

A carpet-forming herb with generally longer leaves than in *S. abyssinica.*

A frequently abundant plant of the forest floor in wet forests and in the bamboo zone, 4250–10 200 ft, but most common above 8500 ft. HE, HM, HA, HK, HN, MUM, KIS, MAC. Also in the Taita and Sagala hills on Mt. Kasigau.

Polhill and Verdcourt 266; Hedberg 1517.

3. ISOETES *L.*

Small terrestrial herbs of seasonally wet places; stem a subterranean, 2–4 lobed, fleshy corm; roots arising from the furrows between the lobes; leaves ligulate, tubular, grass-like, 1-nerved, with 4 longitudinal air channels; sporophylls similar to the vegetative leaves, each with a single large, septate sporangium sunken in its base; spores of two kinds, megaspores and microspores, borne in separate sporangia.

1. Velum absent; leaves of well-developed plants 1·0–1·6 mm thick — 1. *I. abyssinica*
   Velum present, blackish; leaves 0·8 mm thick — 2. *I. tenuifolia*

1. Isoetes abyssinica *Chiov.*

A small, sedge-like plant with tufted leaves 4–20 cm long which are ± semicircular in cross-section.

This plant occurs in sunny, seasonally wet places which remain wet well into the dry season. It often grows in shallow soil over rocks. It sometimes forms part of a 'miniflora' of tiny herbs such as *Ilysanthes* spp. and *Eriocaulon abyssinicum* among larger sedges. Recorded 5000–7850 ft. HE, HM, MAC, NBI.

Napper and Faden 1867; Faden and Evans 71/449.

2. Isoetes tenuifolia *Jermy*

The leaves of this species are generally shorter and more slender than those of *I. abyssinica* and are more nearly circular in cross-section. The velum completely covers the sporangium.

This grows in the same habitat as *I. abyssinica* and was on one occasion found growing with that species. It was known from only two seasonal pools in Thika (5000 ft) one of which has recently been destroyed. MAC.

Faden 71/544; Faden and Kabuye 71/550.

4. EQUISETUM *L.*

Medium-sized, rhizomatous, terrestrial herbs; rhizome subterranean, black; stems green, jointed, hollow, finely ridged longitudinally, often with whorls of similar branches from the nodes; leaves small, 1-nerved, whorled, fused laterally and forming a tube-like sheath ending in small black teeth; sporangia borne on umbrella-shaped sporangiophores, each with 5–10 sporangia on the underside of the hexagonal cap; sporangiophores in dense whorls and forming a terminal strobilus.

Equisetum ramosissimum *Desf.*

A rough-stemmed, colony-forming plant 0·6–1·0 m tall.

This species occurs along streams and river banks. It is rare in our area, occurring 1800–6500 ft, but is more common in the Tsavo area where it occurs down to 500 ft altitude. NAR, RV, NAN, MAC.

Greenway 13100; Archer 654.

5. OPHIOGLOSSUM *L.*

Small perennial, terrestrial (in our area) herbs producing annual fronds; rhizome subterranean, vertical (in our species); fronds simple, fleshy, glabrous, 1–several per plant, margin entire; venation reticulate; fertile frond (spike) without a lamina, its stipe attached to the upper part of the stipe or lower part of the lamina of the sterile frond; sporangia large, borne in two rows on the upper part of the fertile frond; indusium absent.

Note that frequently two or more species are found growing together so that, when one species is found, one should look for others.

1 Frond base cordate; venation prominent — 1. *O. reticulatum*
  Frond base cuneate to rarely somewhat truncate; venation prominent or not — 2
2 Fronds narrowly lanceolate to linear-lanceolate; lamina 0·2–0·7 cm wide; apex acute to acuminate — 2. *O. lusoafricanum*
  Fronds lanceolate to ovate; width various; apex obtuse-mucronate to acute — 3
3 Lamina more than 2·5 cm long — 4
  Lamina less than 2·5 cm long — 5
4 Fertile spike usually attached to the lower part of the sterile lamina; base of sterile lamina always cuneate; old stipe bases persistent; fronds 1–4 per plant; plants of grassland, bushland or seasonally waterlogged, shallow soil; below 7200 ft — 3. *O. polyphyllum*
  Fertile spike attached to the upper part of the stipe of the sterile frond; base of sterile lamina usually cuneate but sometimes truncate; old stipe bases not persistent; fronds 1 or less commonly 2 per plant; plants of forest glades or edges; generally above 7200 ft — 4. *O. vulgatum*
5 Stipe less than 2 cm long; plants of low to medium altitudes in shallow, seasonally waterlogged soil — 5. *O. rubellum*

Stipe 3–4 cm long; plants of high altitude, tussock-sedge bogs 6. *O.* sp. *A*

1. Ophioglossum reticulatum *L.*

This plant has the broadest fronds (up to about 6 cm wide) of any of our species and can be confused only with *O. vulgatum* which sometimes has a truncate but never a truly heart-shaped frond base.

It is recorded from forest edges and damp pockets of soil on rock outcrops but probably occurs in other habitats as well. HE, ?HT, MAC, KAJ. Also in the Shimba hills.

Archer 503; Faden and Evans 71/453.

2. Ophioglossum lusoafricanum *Prantl*

The narrow, grass-like fronds which can reach 9 cm in length readily distinguish this from all other Upland Flora 'adder's tongues'.

Grows in seasonally waterlogged depressions in grassland and in damp pockets of soil on rock outcrops at medium altitudes, always in full sun; very easily overlooked. HT, HM, NBI, KAJ. Also at Dandu.

Faden and Evans 71/448; Faden 72/18.

3. Ophioglossum polyphyllum *A. Br.* (see p. 26)

Our only moderately large (sterile lamina up to 5 cm long and 2 cm wide) species which regularly has several fronds per plant. The consistent attachment of the fertile spike to the sterile lamina instead of to the stipe is unique among Kenya species.

This is the most commonly collected Kenya species and occurs in dry bushland, damp depressions in grassland and shallow, seasonally waterlogged soil over rocks up to 6850 ft. HE, HK, KIT, RV, MAC, KAJ.

Faden 68/857; Polhill and Paulo 1017.

4. Ophioglossum vulgatum *L.*

The absence of a cordate leaf-base distinguishes this species from *O. reticulatum*. The smaller number of larger fronds is the best character to separate this species from *O. polyphyllum*.

This is a plant primarily of forest glades and edges at high altitudes, but in the lower part of its range it occurs in damp depressions in grassland. HE, HM, HA, HK, RV. Also in Taita hills.

Faden and Evans 71/454; Napper 1480.

5. Ophioglossum rubellum *A. Br.*

The tiny (about 1 cm long) ovate-elliptic sterile lamina is a distinctive bluish-green colour and is generally prostrate on the ground. The plants reproduce by root buds and tend to form dense colonies. Very easily overlooked because of its small size.

This plant occurs in seasonally waterlogged pockets of soil on granitic outcrops. It has been collected only once in our area but should be looked for on hills in the Kitui district. MAC. Also in the Tsavo area.

Napper 1605.

6. Ophioglossum *sp.* **A.**

The plants in the single collection of this species look like small delicate specimens of *O. vulgatum*. Whether they represent a distinct species or not can be decided only after further collections have been obtained.

This is recorded as growing in hollows between the tussocks in a *Carex monostachya* bog at 11 000 ft (higher than any record of *O. vulgatum*). HA.

Agnew 7233.

6. MARATTIA *Swartz*

Large terrestrial herbs; rhizome short, stout, erect; fronds tufted; stipes rough near the base, with a pair of persistent stipules at the base, vascular bundles numerous; lamina bipinnate (in our plant), glabrous; margins serrate; venation free; sporangia large, fused laterally into elliptic synangia which are borne dorsally on the veins in two submarginal rows on each pinnule; synangia opening by a longitudinal slit.

Marattia fraxinea *Sm.*

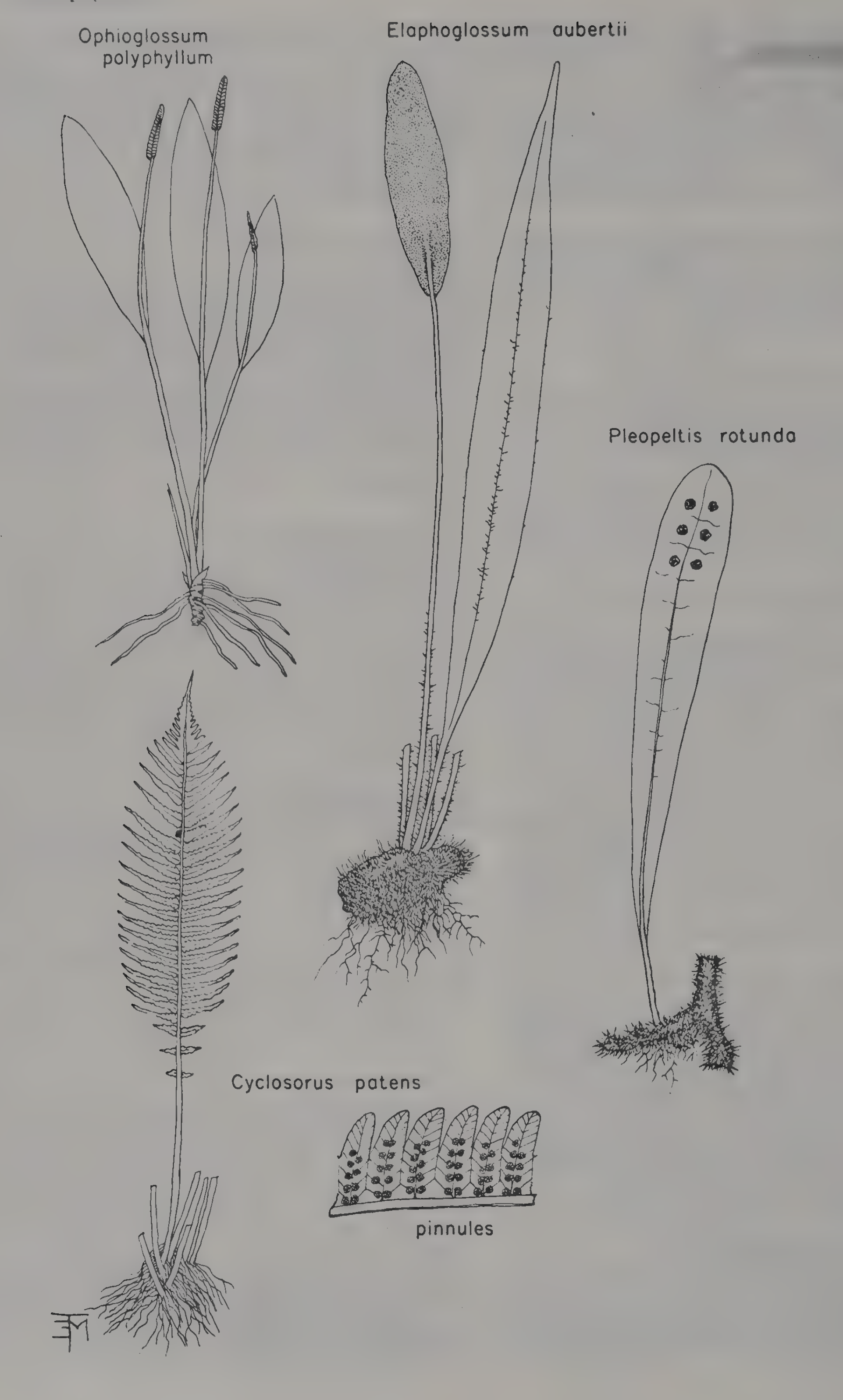
The massive rhizome (up to 40 x 30 cm) and very large fronds readily distinguish this species. The oblong pinnules are up to 16 cm long with long-acuminate apices.

This is a species of moist, montane forests, usually occurring along streams, 5000–7500 ft. HA, HK, HN, MUM, KIS. Also in the Taita and Sagala hills and on Mt. Kasigau.

Polhill and Verdcourt 264; Fries 1856.

7. OSMUNDA *L.*

Medium to large terrestrial herbs; rhizome large, erect, without scales or hairs, covered by a thick mass of black, wiry roots (the 'Osmunda fibre' of orchid growers); fronds tufted, dimorphic; stipes glabrous, with a single U-shaped bundle; lamina bipinnate, glabrous when mature; venation free; margins crenulate; fertile frond completely separate from the sterile frond or else only the upper pinnae of some fronds fertile; fertile pinnae without a lamina; sporangia large (about 0·5 mm), dehiscing by an apical slit; indusium absent.


Ophioglossum
polyphyllum
Elaphoglossum aubertii
Pleopeltis rotunda
Cyclosorus patens
pinnules

Osmunda regalis *L.*

The Royal Fern. A very distinctive plant with opposite or subopposite pinnae and elliptic to lanceolate, subsessile pinnules, to about 1 m tall in Kenya.

An uncommon plant of swamps and river banks, growing either in full sun or partial shade, 4750–8500 ft. HC, HT, HM, HA, HK, KIT, NAR, MAC.

Agnew and Faden 9989; Bally 4788.

8. ANEMIA *Swartz*

Small terrestrial herbs; rhizome short-creeping, densely hairy, without scales; fronds tufted, dimorphic; stipes densely hairy, with a single U-shaped bundle; lamina hairy, ovate to ovate-lanceolate, pinnate to bipinnatifid; venation free (in our plant); lowest pair of pinnae of the fertile fronds strongly erect and long stalked, without a lamina, bearing numerous large (about 0·5 mm) sporangia; indusium absent.

Anemia schimperana *Presl*

Fronds to 30 cm long of which about half is stipe.

An apparently rare plant of rock crevices in dry areas, 3000–5400 ft. BAR, MAC. Also from the Garri hills.

Napper 1642; Faden, Evans, and Rathbun 69/400.

9. MOHRIA *Swartz*

Small terrestrial herbs; rhizome short-creeping, densely covered with pale, narrow scales; fronds tufted; stipes densely scaly and hairy; lamina narrowly lanceolate to narrowly elliptic, pinnate to bipinnatifid, hairy and scaly; venation free; sporangia large (about 0·5 mm), single on the ends of veinlets, marginal or submarginal, often protected by reflexed marginal lobes; indusium absent.

Mohria caffrorum (*L*) *Desv.*

This plant has a superficial resemblance to *Cheilanthes hirta* which however is more finely divided, has much smaller sporangia, and lacks scales on the lamina.

Occurs rarely in high-altitude grassy areas, sometimes in rock crevices, usually fully exposed. HC, KAJ (Ol Doinyo Orok). Also in the Taita hills.

Tweedie 3107; Faden 71/489.

10. GLEICHENIA *Sm.*

Medium-sized terrestrial herbs; rhizome long-creeping, wiry, naked except at the apex; fronds widely spaced, of indeterminate growth; stipes olivaceous, brittle, glabrous; lamina tripinnate (in our plant); pinnae opposite, each with a bud at the base; costules hairy beneath (in our plant); ultimate segments small, about as wide as long; venation free; sori dorsal on the veins, one on each of the ultimate segments, each sorus round and consisting of several large sporangia; indusium absent.

Gleichenia elongata *Bak.*

Stiffly erect plants to 1 m tall forming dense colonies.

Known in Kenya only from the ericaceous zone on the crater rim of Kirui, north-east Mt. Kenya, 8200–8500 ft. HK.

Faden 70/91; Faden, Temba, Karanja, and Gurley 69/527.

11. DICRANOPTERIS *Bernh.*

Medium to large terrestrial herbs; rhizome long-creeping, glabrous or sparsely hairy; fronds widely spaced, of indeterminate growth; stipe glabrous; rachis dichotomously branched; bud present at the base of each dichotomy; pinnules deeply pinnatifid; pinnule lobes oblong and retuse or emarginate at the apex, margins entire; venation free; sori dorsal on the veins, arranged in two rows on each pinnule lobe, ± round and consisting of several large sporangia; indusium absent.

Dicranopteris linearis (*Burm. f.*) *Underw.*

A colonial fern with stiff fronds which are usually glaucous beneath.

A plant of exposed situations, usually on disturbed soil, e.g. roadside banks, 4000–6000 ft, often associated with *Lycopodium cernuum.* HN, RV, NAR, NBI. Also in the Taita hills and on Mt. Kasigau.

Verdcourt 850; Faden, Evans and Worth 69/707.

12. HYMENOPHYLLUM *Sm.*

Small, usually epiphytic herbs; rhizome long-creeping, covered with hairs or glabrous; fronds bipinnatifid (in our species), one cell layer thick; venation free; sori marginal, terminal on a vein; indusium cup-shaped, 2-lipped at the apex, the lips ± equal to the cup in length; receptacle not exserted.

1	Fronds with stellate hairs	2
	Fronds glabrous	3
2	Rachis winged for its entire length	1. *H. splendidum*
	Rachis not winged, or winged only in the upper half of the frond	2. *H. capillare*
3	Margins toothed	3. *H. tunbrigense*
	Margins entire	4. *H. kuhnii*

1. Hymenophyllum splendidum *v. d. Bosch*

Fronds pendent, flaccid, linear, with the hairs more or less confined to the margins and veins.

This plant grows on moist, shaded rocky banks and tree trunks in wet forests, 6500–7500 ft (in our area). HK. Also on Mt. Kasigau.

Faden 71/105; Faden and Holland 72/186.

2. Hymenophyllum capillare *Desv.*

Fronds pendent, flaccid, linear. It is much more common than the previous species and has more densely hairy fronds.

This plant is epiphytic in wet montane forests and is either epiphytic or terrestrial along streams in the bamboo and ericaceous zones, 6500–10 000 ft (in our area). HA, HK, HN, KIS. Also in the Taita hills and on Mt. Kasigau.

Faden and Evans 69/799; Verdcourt 2947.

Hymenophyllum capillare *Desv.* var. **alternialatum** (*Pic. Ser.*) *Faden* **comb. nov.** (*Sphaerocionium capillare* (Desv.) Copel. var. *alternialatum* Pic. Ser., Webbia 23, 196 (1968)).

Differs from the typical variety in having the pinnules slightly decurrent on the rachis. The rachis may thus be winged in the upper part of the frond. Small fronds can have the rachis completely winged and can be confused with *H. splendidum* which occurs at much lower altitudes.

Epiphytic or terrestrial, this variety occurs at generally higher altitudes than the typical variety, 9800–11 000 ft. HA, HK.

Schelpe 2592; Agnew, Hedberg, and Mmari 9640.

3. Hymenophyllum tunbrigense (*L.*) *Sm.*

A medium-sized filmy fern with fronds to 10 cm long and indusium lobes toothed at the apex.

This is an uncommon plant of wet montane forests where it occurs as an epiphyte or on rocks, 6500–8250 ft. HK, HN.

Faden, Temba, Karanja, and Gurley 69/516; Faden, Evans and Worth 69/692.

4. Hymenophyllum kuhnii *C. Chr.*

In addition to its generally longer fronds with entire margins, this species also differs from the previous one in the indusium lobes being entire at the apex.

This is the most common species of *Hymenophyllum* in Kenya, occurring in wet montane forests where apparently it is always epiphytic, 6300–8500 ft (in our area). HM, HA, HK, HN, KIS. Also in the Taita hills and on Mt. Kasigau.

Faden 69/115; Polhill and Verdcourt 303.

13. TRICHOMANES *L.*

Small, commonly epiphytic herbs; rhizome long-creeping (in our species), covered with hairs or glabrous; fronds simple to decompound, usually one cell layer thick (except *T. radicans*); venation free (false marginal vein of *T. erosum* may make veins appear reticulate); sori marginal, terminal on a vein; indusium tubular or conical, usually broadened at the apex, rarely 2-lipped; receptacle frequently exserted.

1 Fronds simple, sometimes irregularly lobed; false marginal vein present — 1. *T. erosum*
  Fronds palmatifid or pinnatifid to decompound; false marginal vein absent — 2
2 Rhizome more than 1 mm thick; fronds to 50 cm long, bi- to tripinnate — 2. *T. radicans*
  Rhizome less than 1 mm thick; fronds to 15 cm long, palmatifid, or pinnatifid to pinnate or tripinnatifid — 3
3 Fronds palmatifid; stipes frequently proliferous — 3. *T. mannii*
  Fronds palmatifid to tripinnatifid; stipes never proliferous — 4
4 Indusium bilabiate, not dilated at the mouth; rhizome hairs branched — 4. *T.* sp. *A*
  Indusium dilated at the mouth, not bilabiate; rhizome hairs unbranched — 5
5 Longitudinal drying folds (appearing like veins) absent; rhizome hairs brown; indusium narrowly tubular, 2–3 times longer than wide — 5. *T. borbonicum*
  Longitudinal drying folds present; rhizome hairs blackish; indusium up to 2 times longer than wide — 6
6 Fronds palmately divided — 6. *T. chevalieri*
  Fronds bi- to tripinnatifid — 7. *T. melanotrichum*

1. Trichomanes erosum *Willd.*

Fronds 1–6·5 cm in length, in our area mostly linear to oblanceolate and frequently shallowly and irregularly lobed.

An uncommon plant in our area which grows on rocky banks, usually near streams, in wet forests, 7000–7850 ft (in our area). HA, HK. Also in the Taita and Shimba hills and on Mt. Kasigau.

Agnew 9003; Faden, Temba, Karanja, and Gurley 69/499.

2. Trichomanes radicans *Swartz*

The large fronds and thick rhizome readily distinguish this species from all others in our area. Most African specimens determined as *T. giganteum* belong here (Pichi-Sermolli *in lit.*).

This plant is known in Kenya from a single collection from the cave behind Thika Falls (not

Chania Falls) in Thika at 4800 ft. MAC.
Faden 68/822A.

3. Trichomanes mannii *Hook.*

The small, palmately divided fronds are darker green and have narrower lobes than the fronds of *T. chevalieri,* the only other Kenya species with similar frond cutting.

This is another wet forest species and is usually epiphytic. In our area it is known from a single collection at 6850 ft. KIS. Also on Mt. Kasigau at 4000 ft.

Faden and Cameron 72/313.

4. Trichomanes *sp.* **A.**

This filmy fern has fronds to 14 cm long and in general looks like *T. melanotrichum* with which it may occur and from which it may be distinguished by the shape of the indusium. The branched rhizome hairs are not found in any other species of *Trichomanes* in East Africa.

A low epiphyte on tree trunks in moist forests, 5300–6850 ft. MUM, KIS. Also from the Taita hills and Mt. Kasigau.

Faden 69/2045A; Faden and Grumbley 72/338.

5. Trichomanes borbonicum *v. d. Bosch*

The fronds of this species can reach 15 cm in length. The shape of the indusium and the absence of vein-like folds easily distinguish this species from *T. melanotrichum.*

A moist-forest plant which grows on wet, rocky banks (rarely on tree trunks), often near streams. Although little collected, it is probably common in the Aberdares and on Mt. Kenya between 7500 ft and 8500 ft. HA, HK. Also in the Taita hills and on Mt. Kasigau.

Napper 711; Faden, Temba, Karanja, and Gurley 69/500.

6. Trichomanes chevalieri *Christ*

The small, palmately divided fronds distinguish this plant from all others in our area except *T. mannii.* The latter has proliferating fronds which are absent in *T. chevalieri.*

A moist-forest plant, usually epiphytic, but occasionally growing on rocks. It is known in Kenya only from the Kakamega forest, the Kericho area, and Thika, altitudes 4750–6850 ft. MUM, KIS, MAC.

Faden 69/2009; Gillett 16689.

7. Trichomanes melanotrichum *Schlechtend.*

The presence of vein-like folds in the dry state and a conical indusium distinguish this plant. In the dry season it may be found curled up.

This is the most widespread filmy fern in Kenya. It is usually found on tree trunks, uncommonly found growing on rocks. Although found in wet forests, it often occurs in wet places in dry forests, and frequently it is the only Hymenophyllacean present. Occurs 4750–10 000 ft in our area. HE, HC, HT, HA, HK, HN, KIT, MUM, KIS, MAC, NBI. Also in the Taita, Maungu, and Sagala hills and on Mts. Kasigau and Marsabit.

Faden 69/2008; Mabberley and McCall 27.

14. MICROLEPIA *Presl*

Medium to large, terrestrial herbs; rhizome thin, creeping, hairy; fronds spaced; stipes hairy, green, with a single U-shaped vascular strand; lamina bi- to tripinnate, the pinnae bi- to tripinnatifid, thin textured, hairy; venation free; sori ± round, terminal on the veins, submarginal; indusium cup-shaped, opening outwards, attached at the base and sides.

Microlepia speluncae (*L.*) *Moore*

Plants with large ovate fronds with alternate pinnae.

Fairly common in open swampy spots in the Kakamega forest, rare elsewhere, 5300–6000 ft. MUM, RV.

Faden 69/2011; Faden and Evans 69/2036.

15. HYPOLEPIS *Bernh.*

Medium to large, terrestrial herbs; rhizome thin, long-creeping, hairy; fronds widely spaced, often of indeterminate growth; stipes hairy; lamina thin-textured, hairy, bipinnatifid to quadripinnate; venation free; sori small, marginal to submarginal, covered by reflexed lobes of the margin; indusium absent.

1 Stipe and rachis reddish-purple with a rough, red pubescence — 1. *H. rugosula*
Stipe and rachis green (above the base) with a soft grey pubescence to nearly glabrous — 2. *H. sparsisora*

1. Hypolepis rugosula (*Labill.*) *J. Sm.* (see p. 31)

The finely-dissected fronds of this plant are generally about 1 m long and, in contrast to *H. sparsisora,* usually have determinate growth. Plants from exposed situations at high altitudes are often dwarfed.

This is primarily found in the bamboo zone, extending up into the ericaceous zone and occasionally into the moorland. It occurs in the open, along forest edges, and along paths, never in dense shade; most common 8800–9800 ft. HE, HL, HA, HK.

Faden 70/116; Verdcourt 3727.

2. Hypolepis sparsisora (*Schrad.*) *Kuhn*
A rank species with large (to about 1·5 m long), finely-dissected fronds of indeterminate growth.

A common plant of open areas (usually derived from forest) at high altitudes. It often occurs intermixed with bracken fern (*Pteridium aquilinum*) and is frequently overlooked for that reason. It is occasionally found growing with *H. rugosula*, but it generally occurs at lower altitudes than that species. HA, HK, HN. Also in the Taita hills and on Mt. Kasigau.

Faden 71/888; Verdcourt 3989.

16. PTERIDIUM *Scop.*
Medium to large, terrestrial herbs; rhizome subterranean, long-creeping, hairy; fronds widely spaced; stipes with numerous, scattered vascular bundles and strands; lamina coriaceous, deltoid, tripinnate, hairy; venation free; sori continuous along the margin, protected by a double indusium, an inner true indusium and the reflexed margin.

Pteridium aquilinum (*L.*) *Kuhn*
A rank species with erect to semi-scandent fronds up to 3 m in length.

The bracken fern, the most abundant fern in Upland Kenya, occurs in large colonies in open areas, at forest edges and along forest paths from 900 ft (Shimba hills) to 8650 ft, being most common at higher elevations. HE, HC, HT, HM, HA, HK, KIT, NAR, RV, MAC, KAJ.

Hedberg 157; Faden 67/703.

17. BLOTIELLA *Tryon*
Medium to large, terrestrial herbs; rhizome thick, woody, ascending to short-creeping, densely covered with long, shaggy, reddish or golden, multicellular hairs; fronds tufted, with determinate growth; stipes grooved above, with several vascular strands arranged in a U-shape; lamina bipinnate to tripinnate, densely hairy; venation reticulate; sori marginal, in the sinuses between marginal lobes, covered by the reflexed margin; indusium absent.

1 Veins raised on the upper surface of the frond; axes with numerous, strongly curved, dark-tipped hairs; pinnules of middle pinnae mostly stalked; rhizome hairs red — 1. *B. stipitata*
  Veins flush with or impressed in the upper surface; axes without dark-tipped hairs or with a few spreading ones only; pinnules stalked or sessile; rhizome hairs golden — 2
2 Veins impressed in the upper surface of the frond; all pinnules sessile; dark-tipped hairs absent — 2. *B. glabra*
  Veins flush with the surface; some pinnules stalked; dark-tipped hairs sometimes present — 3. *B.* sp. *A*

1. Blotiella stipitata (*Alston*) Faden **comb. nov.**
Lonchitis stipitata Alston, Bol. Soc. Brot., sér. 2A, **30**, 19 (1956). (see p. 31)
The fronds can reach 2 m in length. The cutting of the fronds is *extremely variable* and small plants are often fertile. It is generally safe to assume that small plants of this genus associated with large ones which can be identified, belong to the same species, since different species seldom grow intermixed.

A common plant of moist, montane forests, about 5900–7500 ft. This plant usually occurs in dense shade and often forms large colonies. HA, HK, HN. Also in the Taita and Sagala hills and on Mt. Kasigau.

Faden 70/75; Verdcourt and Polhill 2978.

2. Blotiella glabra (*Bory*) *Tryon* (see p. 31)
This plant is similar in size to the previous one. The pinnules have a marked tendency to curl, which is distinctive.

Another moist forest plant, it occurs generally at somewhat higher altitudes than the last species, reaching the lower part of the bamboo zone. It grows in dense shade or fully exposed. HA, HK. Also on Mt. Kasigau.

Faden and Evans 69/896; Perdue and Kibuwa 8301.

3. Blotiella *sp.* **A**
This species is exactly intermediate between the last two species, and may represent a hybrid between them.

The only definite locality for this plant is near the base of volcanic cone Kirui, north-east Mt. Kenya. Several plants were found in this moist, montane forest as were *B. glabra* and *B. stipitata*. HK.

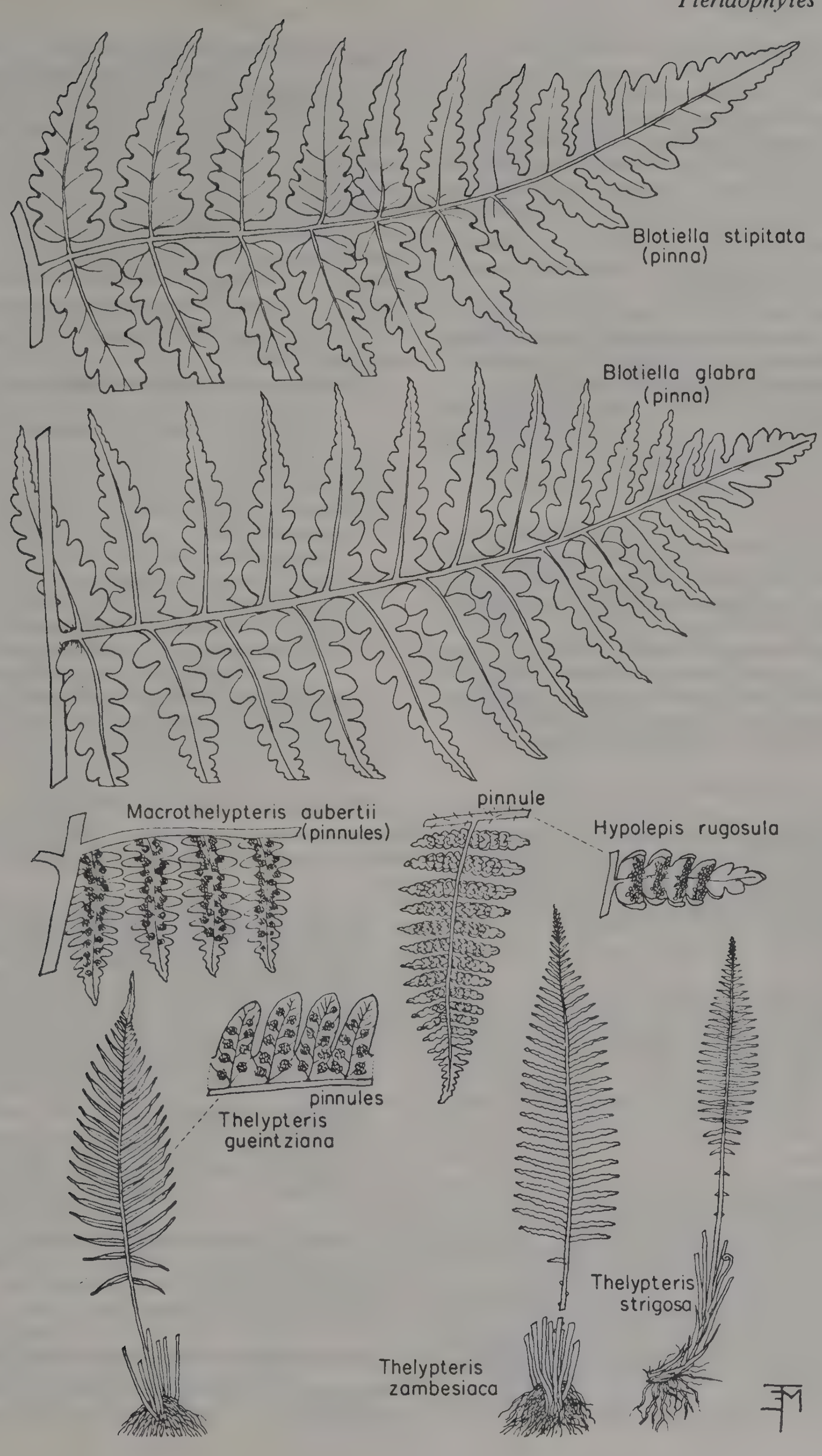
Faden *et al.* 69/536; Faden 70/80.

18. HISTIOPTERIS (*Agardh*) *J. Sm.*
Medium to large, terrestrial herbs; rhizome long-creeping, densely covered with scales and hairs; fronds widely spaced; stipe glabrous; lamina bipinnate-pinnatifid to tripinnate, glabrous, of indeterminate growth; venation reticulate or sometimes nearly free; sori continuous along the margin, covered by the reflexed margin; indusium absent.

Histiopteris incisa (*Thunb.*) *J. Sm.*
A colonial plant with fronds glaucous on the lower surface, with opposite pinnae.

This is a plant primarily of the bamboo zone, occurring usually in glades or clearings, 8250–10 500 ft. HA, HK.

Faden 71/876; Mearns 1741.


Blotiella stipitata
(pinna)
Blotiella glabra
(pinna)
Macrothelypteris aubertii
(pinnules)
pinnule
Hypolepis rugosula
pinnules
Thelypteris
gueintziana
Thelypteris
strigosa
Thelypteris
zambesiaca

19. CONIOGRAMME *Fée*

Medium to large, terrestrial herbs; rhizome long-creeping, densely scaly; fronds spaced; stipes green, glabrous, with a single U-shaped vascular strand; lamina glabrous, pinnate to tripinnate (at the base), margin serrate; venation free, prominent; sori elongate along the veins, sometimes forking; indusium absent.

Coniogramme africana *Hieron.*

Fronds 0·5–1·5 m long with large, unlobed, lanceolate to lanceolate-elliptic pinnae in the upper two-thirds; lower pinnae pinnatifid to bipinnate with lateral veins numerous and ± parallel.

In Kenya this uncommon species occurs along streams and in the spray zone of waterfalls, generally at medium altitudes. HA, HK, MUM, EMB, MAC.

Faden 69/1982; Fries 2041.

20. PITYROGRAMMA *Link*

Medium-sized terrestrial herbs; rhizome short-creeping, densely covered with dark brown scales; fronds tufted; stipes polished brown, glabrous, with a single vascular strand; lamina bi- to tripinnate with small, rounded segments, glabrous above, densely covered with yellow to orange powder beneath (in our plant); venation free; sori elongate along the veins; indusium absent.

Pityrogramma aurantiaca (*Hieron.*) *C. Chr.*

A striking plant because of its orange lower surface. The lanceolate fronds grow to 80 cm long.

Known in Kenya from a single collection in sheltered spots among rocks in moorland at 8300 ft (crater floor of volcanic cone Kirui, north-east Mt. Kenya). HK.

Faden 70/115.

21. ANOGRAMMA *Link*

Small terrestrial herbs; rhizome erect, densely scaly; fronds tufted; stipes glabrous, with a singular vascular strand; lamina bipinnatifid to tripinnate, glabrous; venation free; sori elongate along the veins and often forking with them; indusium absent.

Anogramma leptophylla (*L.*) *Link*

Plant small, delicate with finely-dissected fronds to 15 cm long (often much smaller) and with stipes reddish-brown at the base and green above.

This species occurs on moist, shaded banks and in sheltered rock crevices, 4900–11 200 ft, being most common above 8000 ft. At higher elevations it is usually found near streams. HE, HC, HA, HK, KIT, RV, MAC.

Faden 67/652; Bogdan AB3599.

22. ADIANTUM *L.*

Small to medium terrestrial herbs; rhizome erect to short-creeping, densely scaly; fronds tufted or shortly spaced; stipes polished reddish-brown to black, with two vascular strands at the base, uniting above to form a single T-shaped, lunular or trapezoidal strand; lamina pinnate to quadripinnate, glabrous or hairy; pinnae and pinnules all stalked; pinnae (of pinnate fronds) and pinnules trapezoidal, fan-shaped or wedge-shaped; venation free (in our species); sori borne on the inner face of reflexed marginal lobes; indusium absent; maidenhair ferns.

1 Fronds pinnate, often proliferous at the apex of the rachis — 1. *A. incisum*
Fronds pedate or bi- to quadripinnate, never proliferous — 2
2 Fronds pedate; axes hairy — 2. *A. hispidulum*
Fronds bi- to quadripinnate; axes glabrous — 3
3 Pinnules mostly fan-shaped, articulated and falling off with age — 3. *A. thalictroides*
Pinnules mostly wedge-shaped, not articulated, persistent — 4
4 Pinnules 3·5–9 (–13) mm long; reflexed marginal lobes reniform to round-reniform — 4. *A. raddianum*
Pinnules (8–) 10–20(–27) mm long; reflexed marginal lobes square or oblong — 5. *A capillus-veneris*

1. Adiantum incisum *Forsk.* (see p. 42)

Fronds narrowly-lanceolate to about 30 cm long and 4 cm wide; pinnae hairy, the largest 1·5–2 cm long.

This plant has the lowest moisture requirement of any Kenya species of *Adiantum*; hence it is the most widespread. It grows in moist thickets, and on damp, shady banks in dry forests, sometimes near streams, about 2500–5000 ft. KIS, BAR, EMB, MAC, KAJ. Also in the Taita hills, on Mts. Marsabit and Kasigau, and at Moyale.

Faden, Evans, and Napper 69/254; Napper 491.

2. Adiantum hispidulum *Swartz*

The somewhat fan-like arrangement of the pinnae makes this fern unmistakable; fronds about 30 cm long, pinnules up to 1 cm long, sparsely hairy.

This beautiful fern is associated with streams and waterfalls, 4000–5400 ft, growing in dense shade. MUM, EMB, MAC. Also in the Taita hills and on Mt. Marsabit.

Faden 69/2108; Schelpe 2403.

3. Adiantum thalictroides *Schlechtend.* (see p. 42)

Except for an occasional record of *A. capillus-veneris*, this is the only high-altitude forest

maidenhair fern. Fronds finely-dissected up to 80 cm long, with pinnules up to 2 cm wide.

Occurs chiefly in dry, montane forests, extending along streams up into the ericaceous zone, and rarely down into moist, intermediate forests. Recorded 5300–9800 ft, but rare under 7000 ft. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, BAR, RV, KAJ. Also on Mt. Kulal and in the Murua Nysigar hills.

Verdcourt 2501; Hedberg 65.

4. Adiantum raddianum *Presl* (see p. 42)

The finely-dissected fronds have much smaller pinnules than the native *A. capillus-veneris*, and the veins of the sterile pinnules do not end in marginal teeth as they do in that species.

This tropical American species is commonly cultivated and has become naturalized at Thika (4750 ft) near Chania Falls where it grows with *A. capillus-veneris.* It should be looked for in other localities. MAC.

Faden 68/765, 68/849.

5. Adiantum capillus-veneris *L.* (see p. 42)

This species can be distiguished from both *A. thalictroides* and *A. raddianum* by the veins of the sterile pinnules ending in marginal teeth.

It occurs on rocks in rivers, near waterfalls, and in rock crevices with seepage either in partial shade or full sun. It occurs 3000–8500 ft, but is rare above 5900 ft. HM, HA, RV, NAR, MAG, EMB, MAC, NBI, KAJ. Also in the Taita hills and on Mts. Marsabit and Nyiru.

Greenway 441; Gardner in CM 13093.

23. PTERIS *L.*

Medium to moderately large, terrestrial herbs; rhizome usually stout, woody and short-creeping to ascending, rarely thin and rampant, densely and persistently scaly, or rarely the scales caducous; stipe with one U-shaped vascular strand (rarely with two C-shaped strands at the base uniting above into a U-shape); lamina pinnate to quadripinnate, glabrous and without scales; venation free or rarely (in our species) with a few anastomoses along the costules; costae and costules sometimes with short spines on the upper surface; sori elongate, marginal, covered by the reflexed margins; indusium absent.

1 Fronds pinnate, the upper pinnae always unlobed — 2
  Fronds pinnate-pinnatifid to decompound — 3
2 Pinnae 20–40 pairs; lowest pinnae reduced, never lobed — 1. *P. vittata*
  Pinnae 2–8 pairs; lowest pair of pinnae not conspicuously reduced, always lobed — 2. *P. cretica*
3 At least some veins anastomosing along the costules; rhizome creeping with spaced fronds — 3. *P. buchananii*
  Veins all free; rhizome usually ascending with tufted fronds, rarely creeping with spaced fronds — 4
4 Pinnules or pinnule lobes toothed at the apex — 5
  Pinnules or pinnule lobes entire at the apex — 7
5 Rachis castaneous, beset with numerous sharp spines up to 3 mm long — 4. *P. intricata*
  Rachis variously coloured, not spiny — 6
6 Fronds tripartite, the 3 nearly equal divisions of the frond each pinnate-pinnatifid with oblong pinnule lobes — 5. *P. pteridioides*
  Fronds bipinnate, the basal pinnae bipinnatifid and much larger than the others but not equal to the rest of the frond — 6. *P. dentata*
7 Fronds gemmiferous — 7. *P. preussii*
  Fronds not gemmiferous — 8
8 Pinnae 16–18 pairs; fronds stiffly erect; costules without spines; plants of swamp forest — 8. *P. mohasiensis*
  Pinnae 6–13 pairs (occasionally more in some plants from western Kenya); fronds ascending to stiffly erect; costules with or without spines; plants of various habitats, but not of swamp forest — 9. *P. catoptera*

1. Pteris vittata *L.*

This species is more likely to be confused with *Pellaea* species than with other species of *Pteris.* It can be distinguished from the former by the rachis being scaly (not hairy), dull brown (not polished dark brown or black) and the upper pinnae sessile. The narrowly lanceolate pinnules are 4–10 cm long.

This is an uncommon plant in Kenya, occurring near streams either in dense shade or full sun, 4000–5250 ft. MUM, BAR, MAC. Also in the Taita hills.

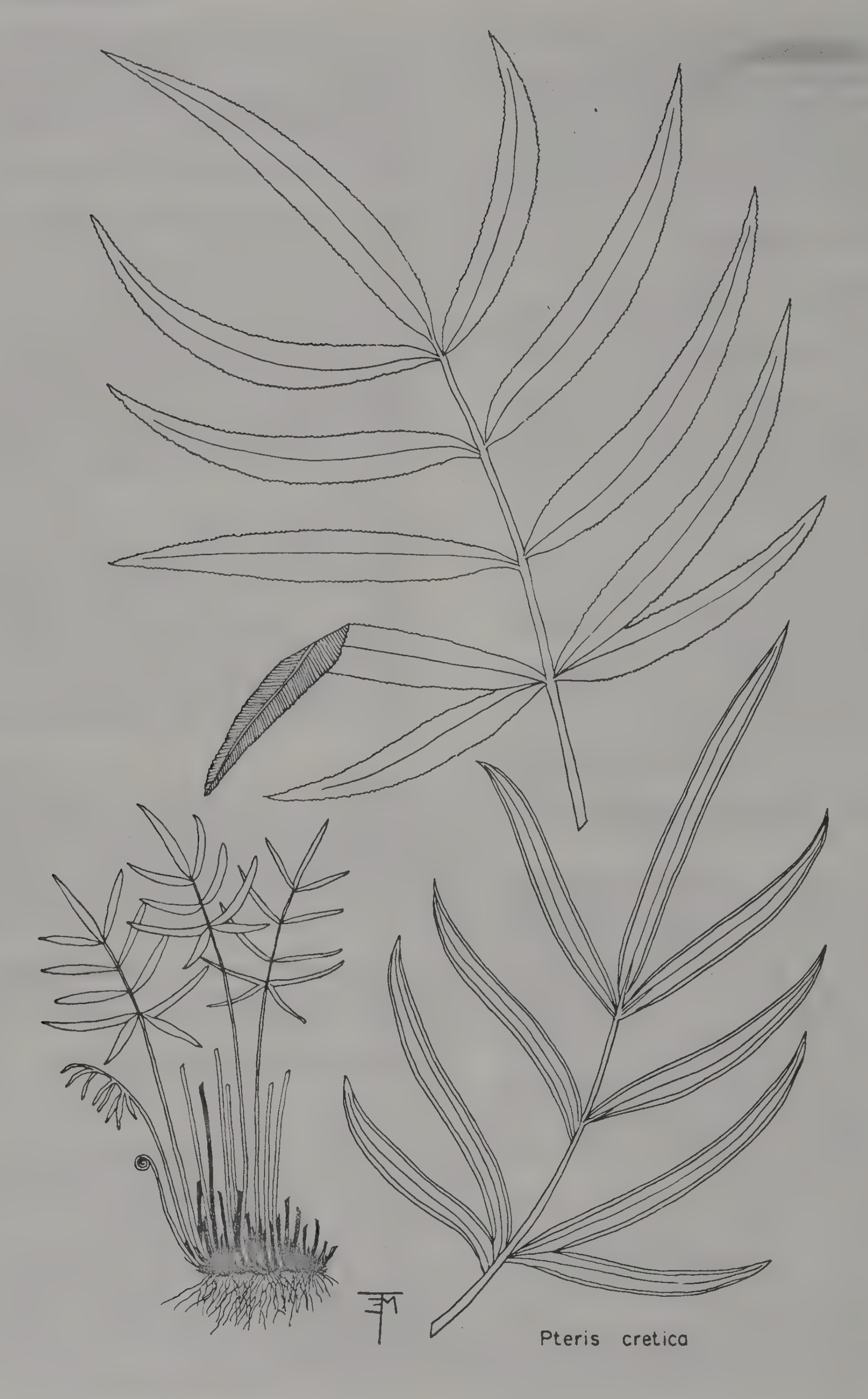
Tweedie 2960; Faden and Evans 69/953.

2. Pteris cretica *L.* (see p. 34)

Fronds to about 60 cm long, somewhat dimorphic with the pinnae of the fertile fronds being much narrower than the pinnae of the sterile fronds; sterile pinnae with coarsely serrate margins.

This is a plant of dry or moist, montane forests, usually occurring in dense shade 4900–8800 ft (rare below 5900 ft). It is much less common east of the Rift Valley than west of it. HE, HC, HT, HM, HA, HK, KIT, KIS, EMB, KAJ.

Hedberg 308; Faden and Grumbley 72/357.


Pteris cretica

3. Pteris buchananii *Bak. ex Sim*

Fronds thin-textured, to 2 m long, tripinnate (those of the similar-looking *P. dentata* are never more than bipinnate). The anastomosing venation does not occur in any other Upland Kenya species of *Pteris*. The pinnule lobes have serrate margins.

This is an uncommon plant of moist, intermediate to montane forests, occurring in dense shade, 5000–7650 ft. HA, HK, EMB, MUM.

Faden 70/388; Balbo 816.

4. Pteris intricata *C. H. Wright*

The large (up to 2 m long), ovate fronds are tripinnate and, because of the long spines on all of the axes, are unmistakable.

The sole Kenya collection of this species came from a swampy spot in a small stream, in the dense shade of a moist, montane forest at 6250 ft altitude. HK.

Faden and Holland 72/196.

5. Pteris pteridioides (*Hook.*) *Ballard*

Fronds 1–2 m long with the middle one of the three divisions somewhat longer than the lateral two; sori short (a quarter to a half the length of the lobe), medial on the pinnule lobes.

This is a plant of moist, intermediate to montane forests, where it grows in dense shade, 5000–6850 ft. It is uncommon east of the Rift Valley. HA, HK, MUM, KIS, KAJ. Also in the Taita hills.

Faden 69/1990; Bally 1137.

6. Pteris dentata *Forssk.*

Fronds thin-textured, light green, up to 1·75 m long, lanceolate to broadly ovate; margins coarsely serrate. Some high-altitude plants are unusual in having creeping rhizomes and shortly spaced fronds instead of the normal ascending rhizomes and tufted fronds.

It occurs in moist shady places in a great variety of habitats, 3250–9800 ft. It is particularly abundant in open *Podocarpus milanjianus* forests and in some pine plantations. HM, HA, HK, KIT, MUM, KIS, RV, NAN, MAC, NBI, KAJ. Also in the Taita, Sagala, and Maungu hills and on Mt. Kasigau.

Verdcourt 3266; Schelpe 2375.

7. Pteris preussii *Hieron.*

Almost identical to medium-altitude (5000–7000 ft) plants of *P. catoptera* but for the presence of a gemma on the upper part of the rachis of every frond. Where the two species occur together, the fronds of *P. preussii* have more pinnae.

A plant of moist, intermediate to montane forests, growing in dense shade, 5250–6650 ft. This is the most common species of *Pteris* in the Kakamega forest. MUM, KIS.

Faden 69/1978; Faden and Cameron 72/293.

8. Pteris mohasiensis *Hieron.*

This species can be distinguished from the occasional plants of *P. catoptera* with more than 13 pairs of pinnae by its stiffly erect habit. The veins in the pinnules tend to fork about one-third of the distance from the costule to the margin instead of forking near the base as in *P. catoptera.*

This plant grows in swamp forest characterized by the tree *Voacanga thouarsii* (Apocynaceae). The sole Kenya locality is the Kabras (Malava) forest (5250 ft). MUM.

Faden 69/2042.

9. Pteris catoptera *Kunze* (see p. 36)

As broadly construed here, this is a rather heterogeneous species. Medium altitude plants have arching, lanceolate fronds with only the basal pair of pinnae forked. High altitude plants have stiffly-erect, lanceolate-ovate fronds which are more divided. Intermediates occur. The fronds are commonly 1–1·5 m long.

It occurs in wet or dry forests, extending up into the bamboo zone, 3250–10 000 ft. It is most often found in dense shade but tolerates full sun. HE, HC, HT, HM, HA, HK, HN, KIT, MUM, KIS, EMB, MAC, NBI, KAJ. Also in the Taita and Sagala hills and on Mts. Kasigau and Marsabit.

Faden 70/121; Bogdan AB4209.

24. NOTHOLAENA *R. Br.*

Small terrestrial herbs; rhizome short-creeping, densely covered with long, narrow, light brown scales; stipes polished black, hairy, with a single vascular strand; lamina coriaceous, bipinnate, hairy above, densely woolly beneath; venation free; sori continuous along the margin which is not reflexed; indusium absent.

Notholaena inaequalis *Kunze* (see p. 38)

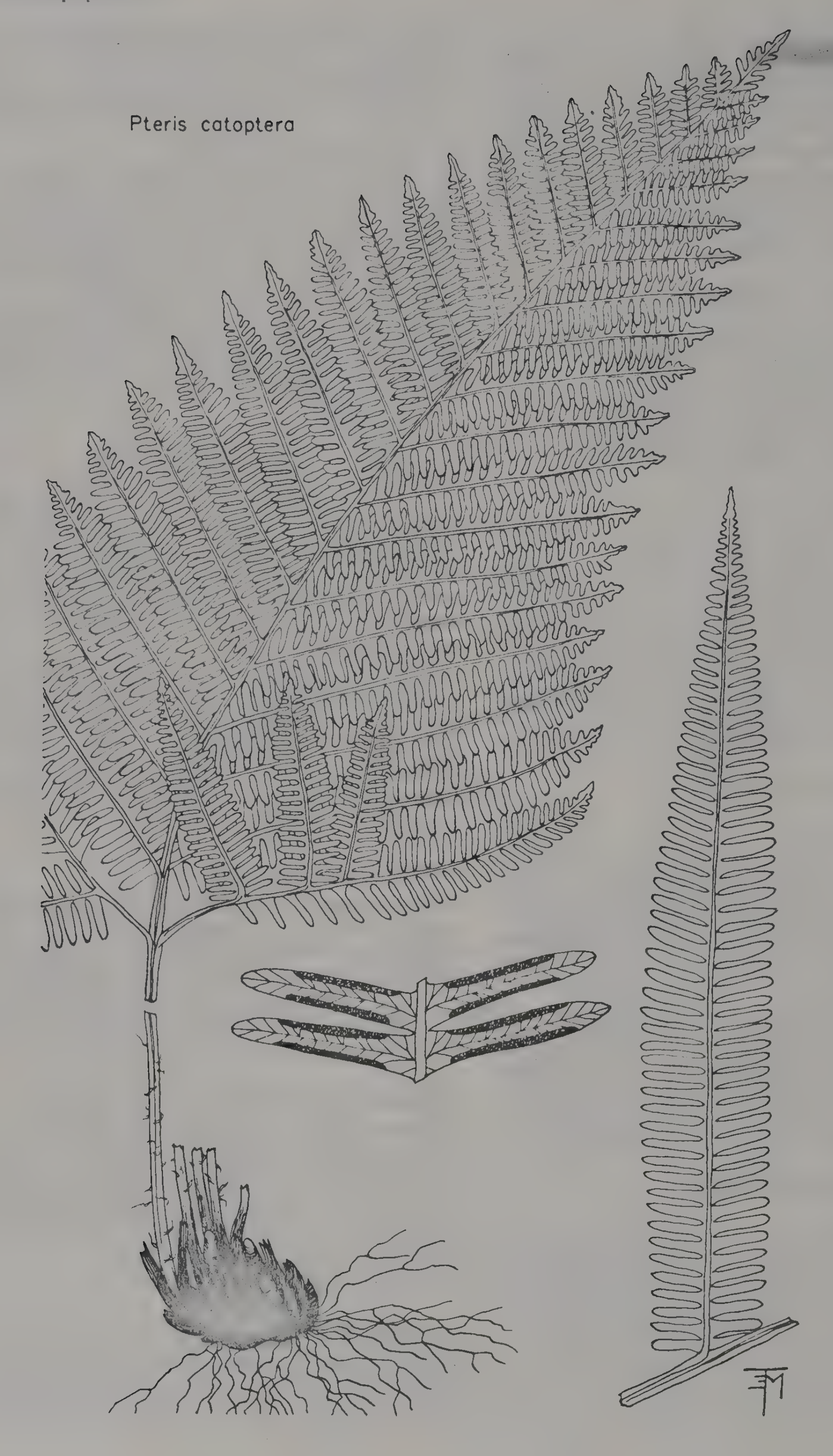
A plant with tufted fronds to 30 cm long in which the pinnae, upon drying, curl upwards, leaving the white or brown, woolly lower surface exposed.

This is an uncommon plant in Kenya which grows in moist, exposed rock crevices, about 5900–8300 ft. HC, HT, NAN, MAC.

Napper 1315; Tweedie 66/366.

25 CHEILANTHES *Swartz*

Small to medium-sized, terrestrial or rarely epiphytic herbs, often of rocky places and roadside banks; rhizome short-creeping, densely scaly;


Pteris catoptera

fronds tufted; stipes usually a polished reddish-brown, with a single U-shaped, V-shaped or triangular vascular strand; lamina bipinnatifid to quadripinnate, hairy or glabrous, sometimes with white powder on the lower surface; venation free; sori marginal, short or elongate, covered by a thin reflexed margin or marginal lobes; indusium absent.

1 Lamina covered with white powder beneath 2
  Lamina lacking white powder beneath 4
2 Upper surface bullate; reflexed margin more than 1 mm wide, more or less continuous; plants occurring only above 8170 ft elevation (in our area) 1. *C.* sp. *A*
  Upper surface not bullate; reflexed margin less than 1 mm wide, regularly lobed almost to the base; plants occurring at various altitudes 3
3 Lamina narrowly elliptic to oblong; middle pinnae lanceolate-ovate; plants occurring above 9000 ft. 2. *C.* sp. *B*
  Lamina lanceolate; middle pinnae lanceolate to lanceolate-oblong; plants occurring below 9000 ft. 3. *C. farinosa*
4 Lamina glabrous 4. *C. multifida*
  Lamina hairy 5
5 Lamina ovate to deltoid; forest plants 5. *C. bergiana*
  Lamina narrowly elliptic to oblong; plants of rock crevices or roadside banks 6. *C. hirta*

1. Cheilanthes *sp.* **A**

The broad, continuous, reflexed margin is the best character for separating this from the other two 'white-backed' *Cheilanthes* species.

Occurs near streams and waterfalls in the moorland, extending down into the bamboo zone, 8000–12 000 ft. Occurs with *C.* sp. *B* but not with *C. farinosa*. HE, HA, HK, HN.

Faden 71/69; Hedberg 897.

2. Cheilanthes *sp.* **B**

A plant of this species is best distinguished from the two other 'white-backed' *Cheilanthes* by elimination: if it is growing at too high an altitude for *C. farinosa* and lacks a continuous reflexed margin, so it is not *C.* sp. *A*, then it must be *C.* sp. *B*.

It occurs with *C.* sp. *A* in the moorland but does not extend into the bamboo zone, 9750–12 000 ft. This plant is much less common than *C.* sp. *A*. HE, HA.

Faden and Evans 69/792; Hedberg 897a.

3. Cheilanthes farinosa (*Forssk.*) *Kaulf.* (see p. 38)

This is the only 'white-backed' *Cheilanthes* throughout most of its altitudinal range. For distinctions from *C.* sp. *A* and *C.* sp. *B* see above. The fronds are up to 60 cm long.

This species is terrestrial or occasionally epiphytic. It occurs in a variety of situations but most commonly along streams and near waterfalls. It is also frequent on moist roadside banks. Occurs 5000–9000 ft. HE, HC, HT, HM, HK, KIT, MUM, KIS, MAC, KAJ. Also in the Taita and Murua Nysigar hills.

Faden 67/583; Verdcourt 938.

4. Cheilanthes multifida (*Swartz*) *Swartz*

Fronds finely-dissected, tri- to quadripinnate, up to 50 cm long; lamina lanceolate to lanceolate-ovate.

This is a common plant of dry forests and moist bushland, occurring on banks and in rock crevices, usually in partial shade, 3250–8300 ft. HC, HT, HA, KIS, NAR, RV, NAN, MAC, KAJ. Also in the Taita and Murua Nysigar hills, on Mt. Kasigau, and at Furroli.

Glover, Gwynne, and Samuel 3073; Gardner 1036.

5. Cheilanthes bergiana *Kunze*

Fronds finely dissected, ovate to deltoid, tripinnate with a lamina up to about 30 cm long and wide.

Occurs on moist, shaded banks in moist, intermediate to montane forests, about 5250–7500 ft. Uncommon. ?HE, ?HM, MUM, KIS. Also occurs in the Taita hills.

Faden 69/2111; Faden and Cameron 72/322.

6. Cheilanthes hirta *Swartz* (see p. 38)

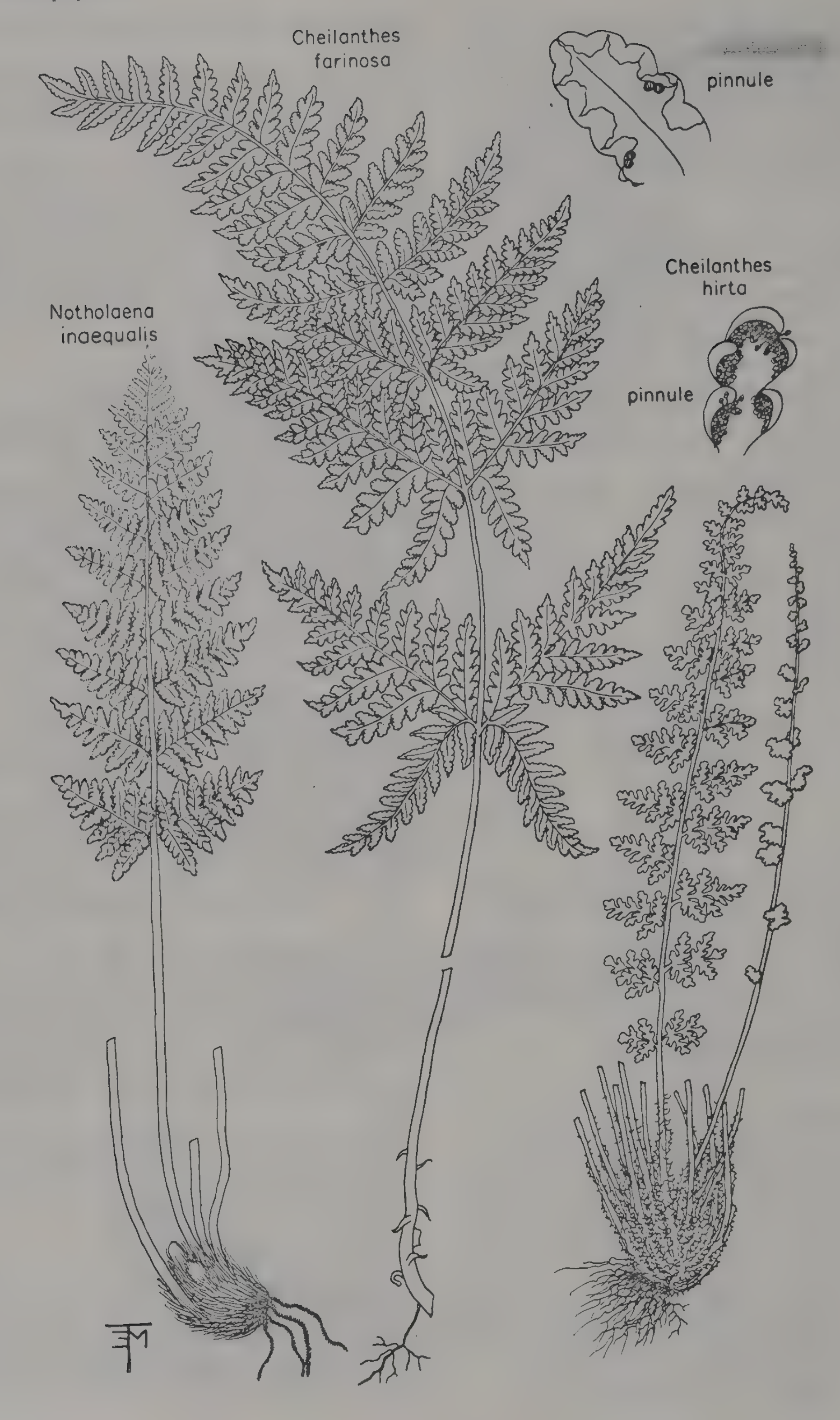
The narrow, finely-dissected, hairy fronds which grow to 30 cm long (in our area) can be confused only with *Mohria caffrorum*. They differ from those of that species, which is known from only one locality in western Kenya, in being more dissected and in lacking scales on the rachis and costae.

This is a species of moist, usually exposed, rock crevices and roadside banks, about 6400–8300 ft. HC, HT, KIT, KIS, BAR.

Tweedie 67/39; Faden 70/897.

26. DORYOPTERIS *J. Sm.*

Small terrestrial herbs; rhizome short-creeping to erect, densely scaly; fronds tufted; stipes polished brown, with a single vascular strand; lamina deltoid, shorter than the stipe, tripinnatifid; venation free; sori marginal, interrupted or continuous,


Cheilanthes farinosa
pinnule
Cheilanthes hirta
Notholaena inaequalis
pinnule

partially covered by the thin reflexed margin or marginal lobes; indusium absent.

1 Reflexed margin discontinuous
1. *D. concolor*
Reflexed margin continuous, interrupted only at the sinuses and frequently at the apices of the pinnules
2. *D. nicklesii*

1. Doryopteris concolor (*Langsd. & Fisch.*) *Kuhn* (see p. 42)

An attractive fern with tufted fronds to 30 cm long.

This is a characteristic plant of dry forest, but also occurs in wet forest (e.g. Kakamega), being recorded 3250–7500 ft. Grows in dense shade. HC, HT, HM, HA, KIT, MUM, KIS, NAR, EMB, MAC, NBI, KAJ. Occasional in mountains outside our area.

Faden 71/856; Hedberg 290.

2. Doryopteris nicklesii *Tard.*

In addition to the key character of the reflexed margin, this species may be distinguished from *D. concolor* by its somewhat dimorphic fronds, the fertile ones having much longer stipes than the sterile ones.

Known in Kenya from a single collection. It was found growing on shaded, mossy banks in evergreen thickets along the Tiva River near Kitui at 3900 ft. MAC.

Faden 71/377.

27. PELLAEA *Link*

Small to medium sized, terrestrial herbs; rhizome short-creeping, densely scaly; fronds tufted; stipes polished reddish-brown to black, with a single U-shaped vascular strand; lamina pinnate to quadripinnate, glabrous or hairy; venation free or reticulate; sori continuous along the margin and covered by the reflexed margin; indusium absent.

1 Fronds pinnate (rarely bipinnate at the base); terminal pinnule articulated 2
Fronds bi- to quadripinnate; terminal pinnule articulated or not 4
2 Pinnae glabrous; venation free 1. *P. doniana*
Pinnae hairy; venation free or reticulate 3
3 Venation free (sometimes the pinnae have to be cleared in order for this character to be seen); scales on crozier and base of stipe black 2. *P. longipilosa*
Venation reticulate; scales tan
3. *P. schweinfurthii*
4 Terminal pinnules articulated 5
Terminal pinnules not articulated 6
5 Pinnules grey-green, rhomboidal, hastate at base; rachis glabrous 4. *P. calomelanos*
Pinnules green, lanceolate, cordate at base; rachis puberulous on the upper side
5. *P. boivinii*
6 Rachis and stipe with numerous, spreading, brown, hair-like scales; venation not clearly visible 6. *P. involuta*
Rachis without scales; stipe scaly only at the base; venation clearly visible 7
7 Fronds ovate to deltoid, tri- to quadripinnate, usually coriaceous 7. *P. quadripinnata*
Fronds lanceolate to ovate, rarely deltoid, bipinnate to tripinnate, texture herbaceous 8
8 Fronds deltoid; plants of wet forest
8. *P.* sp. *A*
Fronds lanceolate to ovate; plants of bushland, thicket, or forest
9 Rachis with tan, scarious ridges on the upper side; segments mostly rounded at the apex; fronds lanceolate to ovate
9. *P. adiantoides*
Rachis lacking scarious ridges; segments acute at apex; fronds lanceolate-elliptic
10. *P. viridis*

1. Pellaea doniana *Hook.*

The venation is much more easily seen in this species than in the related *P. longipilosa* and *P. schweinfurthii.* The pinnules tend to be longer (up to 10 x 2 cm in our area).

In our area this uncommon plant occurs in shaded, moist thickets and on banks, usually in riverine forest at about 5000 ft. MAC. Also sporadic in lowland rain forest along the coast.

Faden 68/915; Opiko 324.

2. Pellaea longipilosa Bonap. (see p. 41)

Fronds to about 30 cm long. Extremely similar to *P. schweinfurthii* and separated for certain only by its free venation. The venation can be seen in young fronds by placing them in front of a strong light (e.g. the sun). For old plants use the scale colour in the field.

A species of dry, usually fully exposed, rock crevices, occurring 2000–7850 ft. When this species occurs in the same area as *P. schweinfurthii*, the latter is found to grow in the moister, more sheltered situations. BAR, EMB, MAC. Also on Mt. Kasigau and on scattered hills in northern Kenya.

Faden, Temba, and Karanja 69/494; Napper 492.

3. Pellaea schweinfurthii (*Hieron.*) *Diels*

Fronds up to 40 cm long. For distinctions from *P. longipilosa* see above. Old pinnules can be cleared by placing them in a 5–10 per cent solution of sodium or potassium hydroxide for 1–2 days.

Occurs in moist rock crevices, either in shade or full sun, about 2800–6500 ft. KIT, NAN, MAC, KAJ. Also in the Taita hills, the Mathews range, and on Mt. Kasigau.

Faden and Evans 69/165; Napper 1607.

4. Pellaea calomelanos (*Swartz*) *Link* (see p. 41)

The colour and shape of the pinnules make this the most easily recognized *Pellaea* in Kenya. The lamina is ovate to deltoid, bipinnate and up to 30 cm long. The venation is obscure.

A common plant of dry or moist, rock crevices and roadside banks in full sun, 5000–8800 ft. HC, NAR, BAR, RV, NAN, MAC, KAJ. Also on hills in northern Kenya.

Verdcourt 3567; Bally 5442.

5. Pellaea boivinii *Hook.*

Fronds lanceolate-ovate, tripinnate at the base, bipinnate above, venation free.

Only collected once in our area, growing in rock crevices at about 6850 ft on Ol Doinyo Orok (Mt. Namanga). KAJ.

Archer in EAH 15086.

6. Pellaea involuta (*Swartz*) *Bak.*

In frond-cutting this plant resembles *P. adiantoides* but lacks the scarious ridges on the rachis. The fronds reach about 30 cm in length (in our area).

This is an uncommon plant (in our area), occurring in rock crevices and moist thickets up to about 6250 ft. HK, MUM, KIS, RV, MAC. Also in the Taita hills, on Mt. Kulal, and sporadically in dry coastal forests.

Faden and Evans 69/305; Kerfoot 3452.

7. Pellaea quadripinnata (*Forssk.*) *Prantl*

This is the most finely-dissected Kenya species of *Pellaea*. The glabrous pinnules are 1–2 cm long.

Occurs on banks and along roadsides in moist montane forests and in the bamboo zone. It grows in partial shade or full sun, about 4250–8000 ft (rare below 6850 ft in our area). HE, HC, HT, HM, HA, HK, HN, RV, KAJ. Also on the Taita and Sagala hills.

Faden, Evans, and Worth 69/701; Bally 352.

8. Pellaea *sp.* **A.**

The deltoid fronds, with long (up to about 8 cm), linear-lanceolate segments readily distinguish this species, which is sometimes considered to be only a variety of *P. viridis.*

Plants of forest edges, occurring 4000–5600 ft. Collected only once in our area. HN. Also in the Taita and Sagala hills.

Faden, Evans and Worth 69/710.

9. Pellaea adiantoides (*Willd.*) *J. Sm.* (see p. 41)

This is *Pellaea viridis* var. *glauca* of Schelpe (1970). Fronds up to 50 cm long with segments usually 1–2 cm long.

Grows in dry bushland and dry rocky places, frequently in full sun, 2000–7300 ft; never found in forest. HC, HA, KIT, KIS, BAR, RV, NAN, EMB, MAC, NBI, KAJ. This is one of the most common ferns in Kenya and occurs in suitable habitats everywhere except the coastal strip.

Glover 3733; Hemming 245.

10. Pellaea viridis (*Forssk.*) *Prantl* (see p. 42)

Fronds 30–50 cm long, with segments usually 1·5–4 cm long.

This is generally a plant of moist thickets and dry forests, where it often occurs along paths and on banks. It occasionally grows in the open or along streams. Common in Kenya, occurring about 3000–7500 ft. HM, HA, HN, KIT, MUM, KIS, NAR, NAN, EMB, MAC, NBI, KAJ. Also in the Taita, Sagala, and Murua Nysigar hills and on Mts. Kasigau and Marsabit.

Faden 67/710; Hanid 307.

28. ASPIDOTIS (*Hook.*) *Copel.*

Small terrestrial herbs; rhizome short-creeping, densely scaly; fronds tufted; stipes glabrous, polished brown, with a single vascular strand; lamina deltoid, glabrous, tripinnate, the pinnules bipinnatifid; segments acute; venation free; sori in sinuses between marginal teeth, covered by whitish, scarious, reflexed marginal lobes; indusium absent.

Aspidotis schimperi (*Kunze*) *Pic. Ser.*

The finely-dissected fronds are 20–50 cm long, with the stipes longer than the laminae.

A plant of woodland, forest or exposed sites, often in rocky places; in our area recorded from 'hill tops, desert country, rock crevices'. BAR (Kacheliba).

van Someren 633.

29. ACTINIOPTERIS *Link*

Small, terrestrial herbs; rhizome short-creeping, densely scaly, often with a scent of bitter almonds when freshly cut; fronds tufted; stipe scaly, grey or green above, grooved, below 3-ridged, with a broad, brown median ridge separated by grooves



Pellaea calomelanos

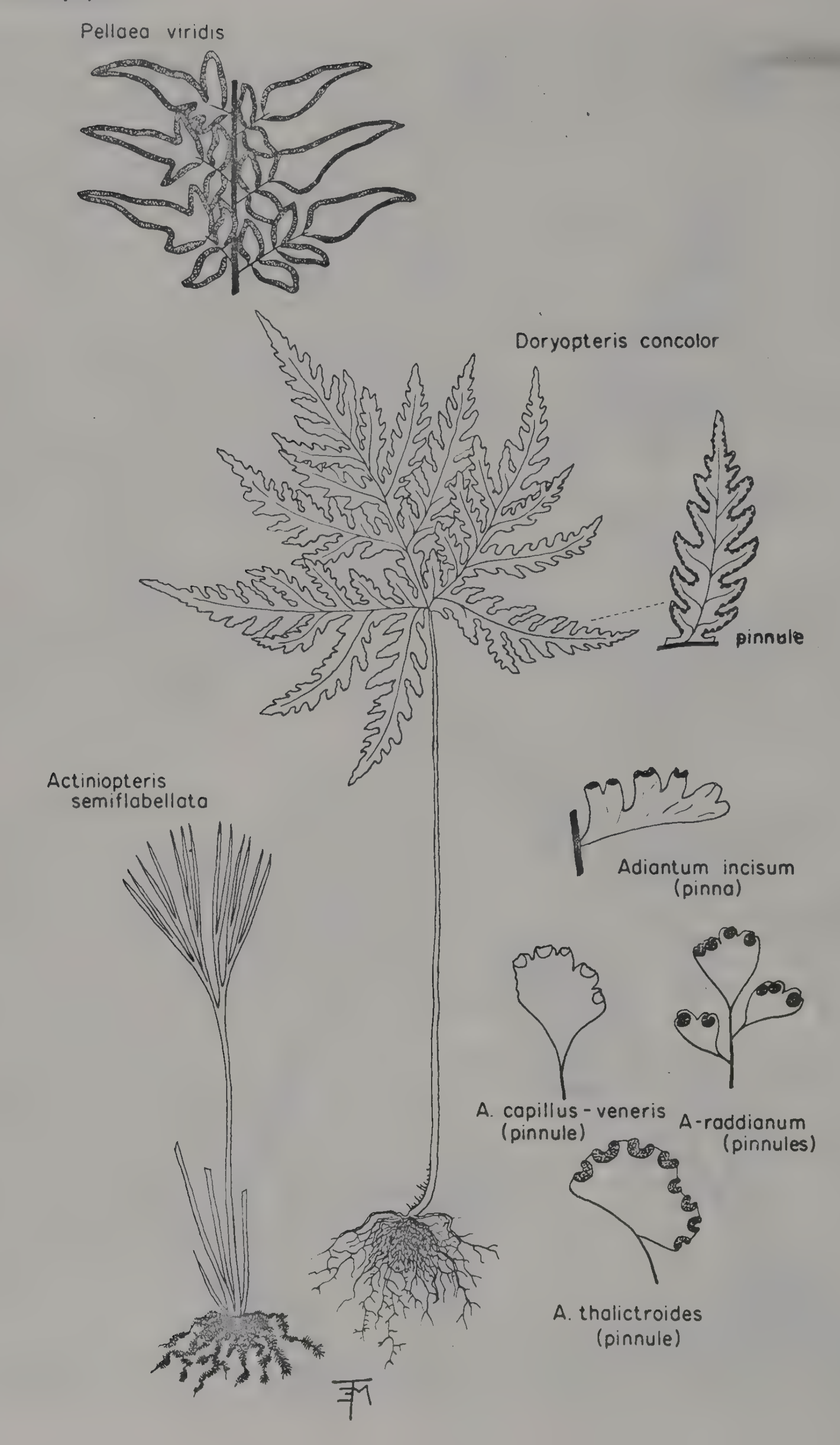
pinnule

Pellaea adiantoides

pinnule

pinna

Pellaea longipilosa



Pellaea viridis
Doryopteris concolor
pinnule
Actiniopteris
semiflabellata
Adiantum incisum
(pinna)
A. capillus-veneris
(pinnule)
A-raddianum
(pinnules)
A. thalictroides
(pinnule)

from 2 outer, grey or green ridges; vascular bundle 1, U-shaped; lamina shorter than the stipe, fan-shaped or wedge-shaped, scaly, dichotomously divided into linear or narrowly wedge-shaped segments; sori sub-marginal, covered by the reflexed margins; indusium absent.

1 All fronds wedge-shaped to broadly obdeltoid, each segment ending in a single hard point 1. *A. semiflabellata*
Some or all of the fronds broadly fan-shaped; segments of at least the sterile fronds ending in several teeth 2
2 Fronds dimorphic; segments of the fertile fronds ending in a single point, sometimes bordered by small teeth 2. *A. dimorpha*
Fronds uniform; segments of the fertile fronds ending in several teeth 3. *A. radiata*

1. Actiniopteris semiflabellata *Pic. Ser.*

Fertile fronds up to 30 cm long. This is the only *Actiniopteris* in which the segments of all fronds end in one hard point. Small secondary teeth may occur lateral to the main point on some or all segments.

This is a common fern in Kenya and is the most common *Actiniopteris*. It occurs in dry or moist, shaded or exposed, rock crevices, 2000–6850 ft. HK, KIS, NAR, BAR, RV, NAN, EMB, MAC, NBI, KAJ. Also occurs in many localities in eastern and northern Kenya.

Faden 67/653; Gillett 17289.

2. Actiniopteris dimorpha *Pic. Ser.*

The sterile fronds are similar in cutting to those of *A. radiata* (they tend to have more teeth per segment than in that species), while the fertile fronds resemble those of *A. semiflabellata*.

Dry rock crevices, 1750–3000 ft. Uncommon in our area. MAC, KAJ. Also known from Mts. Kasigau and Tsavo and Meru National Parks.

Verdcourt 3881; Faden 72/17.

3. Actiniopteris radiata (*Swartz*) *Link*

Distinguished from both of the above species in having both the fertile and sterile fronds with segments ending in several ± equal teeth.

Occurs in dry rock crevices, growing on the whole in somewhat drier situations than *A. semiflabellata*, although the two not infrequently occur together. Occurs about 100–6250 ft. BAR, RV, MAG, EMB, MAC, KAJ. Also occurs in many localities in eastern and northern Kenya.

Faden 67/645; Verdcourt 2642.

30. NEPHROLEPIS *Schott*

Medium to large, terrestrial herbs; rhizome erect, scaly, producing numerous stolons, sometimes producing subterranean tubers; fronds tufted; stipes with several vascular bundles; lamina pinnate, the pinnae articulated to the rachis; margins serrate; venation free; sori round, terminal on the veins, borne in two rows on each pinna; indusium semilunular to round-reniform.

1 Pinnae without basal auricles; indusium facing the margin of the pinna; middle pinnae 7–15 (–23) cm long; tubers absent 1. *N. biserrata*
Pinnae with basal auricles; indusium facing the apex of the pinna; middle pinnae 1·5–5 cm long; tubers usually present 2
2 Rhizome annual; fronds one to few, annual; rachis glabrous or nearly so 2. *N. undulata*
Rhizome perennial; fronds numerous, perennial; rachis hairy 3. *N. cordifolia*

1. Nephrolepis biserrata (*Swartz*) *Schott*

Fronds usually 1–2 m long; pinnae oblong, sessile, with rounded to truncate bases and acuminate apices; indusium round-reniform with a very narrow sinus.

This is a plant of moist forests. It is rare in our area. HE, HA, RV. Also occurs sporadically in coastal forests.

Polhill 3; Glover 3542.

2. Nephrolepis undulata (*Swartz*) *J. Sm.*

Rhizome very slender and, like the fronds, annual, only the subterranean, easily-detached, ellipsoid tubers persisting during the dry season.

This species forms dense colonies in moist thickets at moderate altitudes in western Kenya. Supposed records east of the Rift Valley almost certainly refer to the next or some other cultivated species. HC, KIT, MUM.

Williams 572; Faden 71/462.

3. Nephrolepis cordifolia (*L.*) *Presl*

The perennial rhizome and narrow fronds readily distinguish this from the two native species of *Nephrolepis*. Subterranean tubers are sometimes present. The fronds may be erect, or (in moist, shaded situations) arching or pendent.

A native of tropical America and tropical Asia, this plant is commonly cultivated. It is naturalized at Thika (near Chania and Thika Falls, altitude 4850 ft) and perhaps elsewhere. MAC.

Faden 68/904.

31. ARTHROPTERIS *J. Sm.*

Medium-sized, terrestrial or epiphytic herbs; rhizome thin, long-creeping, scaly; fronds widely

spaced; stipes finely hairy, articulated above the base, sometimes above the middle, the articulation usually noted as a swelling, lamina pinnate, the pinnae pinnatifid and articulated to the rachis; venation free; sori ± round, terminal on the veins; indusium round-reniform.

1 White calcareous dots present on the upper surface of the lobes; sporangia 1–8 on each lobe; stipe articulation usually above the middle — 1. *A. orientalis*
White dots absent; sporangia 1 on each lobe; stipe articulation usually below the middle — 2. *A. monocarpa*

1. Arthropteris orientalis (*Gmel.*) *Posth.*

Fronds generally 25–40 cm long; lamina lanceolate to lanceolate-elliptic.

This is a plant of dry forests and dry or moist thickets. It grows in partial shade on rocks or on the ground, and is rarely epiphytic, occurring about 2950–7850 ft. HC, ?HL, ?HK, HN, MUM, KIS, RV, MAC, KAJ. Also in the Taita hills and on Mt. Kasigau.

Agnew, Kibe, and Mathenge 10360; Faden, Evans and Worth 69/706.

2. Arthropteris monocarpa (*Cordem.*) *C. Chr.*

The fronds are thinner textured than those of *A. orientalis* and are usually somewhat longer than them.

Ecologically this species is absolutely distinct from *A. orientalis*, occurring in moist, montane forest, sometimes near streams, and extending up into the bamboo zone. It can be either terrestrial or epiphytic, but if the latter, then the rhizome is rooted in the ground and ascends the tree trunks. HE, HA, HK, KIS.

Napper 717; Faden and Grumbley 72/343.

32. OLEANDRA *Cav.*

Epiphytic or, rarely, terrestrial herbs; rhizome long-creeping, densely covered by appressed scales; fronds simple, widely spaced; stipes with several vascular bundles, articulated a short distance above the point of attachment to the rhizome; lamina oblong to oblong-elliptic; venation free, prominent; sori round, dorsal on the veins, subcostal; indusium round-reniform.

Oleandra distenta *Kunze*

Stems stiff, free of roots for a great length and often hanging from the trees; fronds with entire margins and abruptly acuminate apices.

A plant of wet forests, 5000–8200 ft. HA, HK, RV. Also occurs on Mt. Kasigau.

Greenway 13815; Faden 69/017.

33. DAVALLIA *Sm.*

Medium sized, epiphytic or, rarely, terrestrial herbs; rhizome long-creeping, densely scaly; stipes articulated a short distance above the attachment to the rhizome, with several vascular bundles; lamina glabrous, ovate to deltoid, about quadripinnate; venation free; sori marginal, terminal on the veins; indusium cup-shaped, fixed at the base and sides, flanked by horn-like projections of the lamina.

Davallia chaerophylloides (*Poir.*) *Steud.*

A finely divided, usually pendent epiphyte with alternate pinnae.

This species has been collected in our area only once; it was found along the Yala River. MUM. Also in the Maungu hills and along the coast.

Agnew, Waithaka *et al.* 10034.

34. CYATHEA *Sm.*

Tree ferns with unbranched trunks 1–10 m tall, rarely shorter; stipe bases persistent or not, if not, then leaf scars very prominent; fronds clustered at the top of the trunk, 1–3·5 m long; stipes scaly at the base, with numerous vascular bundles; lamina pinnate or bipinnate; venation free (in our species); sori spherical, dorsal on the veins; indusium, if present, surrounding the sorus and attached at its base, often cup-shaped.

1 Fronds pinnate, up to 1·5 m long; pinnae deeply pinnatifid — 1. *C. stuhlmannii*
Fronds bipinnate, 2–3·5 m long; pinnules deeply pinnatifid — 2
2 Stipe bases finely muricate; scales uniformly coloured; old dead fronds pendent below the living ones; cross-section of trunk with about 10–12 vascular strands; costae usually glabrous above, sometimes with long, fine hairs — 2. *C. dregei*
Stipe bases very spiny; scales with broad pale margins; old fronds never pendent; cross-section of trunk with about 5–6 vascular strands; costae densely and finely hairy above — 3. *C. manniana*

1. Cyathea stuhlmannii *Hieron.*

Trunk up to about 2 m high, diameter 4–5 cm, with about 5 vascular strands; stipe bases not persistent.

This is a rare plant in our area and grows in moist, montane forest, about 5250–6500 ft. HK, HN. Also in the Taita hills.

Schelpe 2427; Faden, Evans, and Worth 69/705.

2. Cyathea dregei *Kunze*

The old stipe bases persist on the trunk, but they are broken up and fibrous, not whole and spiny as in *C. manniana.* The trunks can reach about 6 m in height and about 20 cm in diameter. The stipe base scales are longer and much narrower than those of *C. manniana.*

This plant occurs in dense shade along streams and is rare in our area. Recorded about 4250–5900 ft. HN. Also in the Taita hills.

H. D. van Someren 328.

3. Cyathea manniana *Hook.*

As broadly interpreted here, this plant has trunks which grow to about 10 m tall and 15 cm in diameter. Spiny stipe bases persistent, (or very rarely not), the spaces between them becoming filled with epiphytic mosses and ferns (particularly *Asplenium hypomelas*).

This is the common tree fern in Kenya, and forms dense stands in steep, forested valleys along rivers in the Aberdares and on Mt. Kenya. It is rarely found far from water (in our area). Young plants often grow on exposed roadside banks but they never mature. Occurs about 5000–8200 ft. HC, HM, HA, HK, HN, KIS. Also in the Taita and Sagala hills.

Faden 70/387; Mabberley and McCall 19.

35. DIDYMOCHLAENA *Desv.*

Large terrestrial herbs; rhizome large, woody, erect, densely scaly; fronds tufted; stipe with several vascular bundles arranged in a U-shape; lamina lanceolate-elliptic to narrowly oblong, bipinnate; pinnules trapezoidal, articulated; margin crenulate; venation free; sori submarginal, elliptic, terminal on the veins; indusium the same shape as the sorus, attached in the centre and at the base, free at the sides and apex.

Didymochlaena truncatula (*Swartz*) *J. Sm.* (see p. 59)

A handsome plant with fronds to 2 m long, easily recognized by its *Albizia*-like pinnules.

This is a rather uncommon plant, of wet forests, occurring about 5000–6850 ft. HA, HK, HN, KIS, KAJ. Also in the Taita hills and on Mt. Kasigau.

Bally 1142; Agnew 9011.

36. DRYOPTERIS *Adans.*

Medium to large, terrestrial herbs; rhizome thick, woody, short-creeping to erect; fronds tufted; stipes densely scaly at the base, with several vascular bundles arranged in a U-shape; lamina bipinnate to tripinnate; margin toothed; rachis and costae scaly; venation free; sori round, dorsal on the veins; indusium, if present, round-reniform, attached at its sinus.

1 Fronds gemmiferous; indusium absent — 1. *D. manniana*
Fronds not gemmiferous; indusium present or absent — 2

2 Rachis with numerous, spreading, reddish-brown, hair-like scales; stipes with dense, narrow, spreading white scales (turning brown with age or upon drying) — 2. *D. squamiseta*
Rachis and stipe scales various but not as above — 3

3 Pinnules obliquely cuneate at the base — 4
Pinnules rounded to truncate at the base — 5

4 Pinnae strongly ascending; texture coriaceous to firmly herbaceous; plants of wooded grassland — 3. *D. athamantica*
Pinnae at ± right angles to the rachis; texture herbaceous; forest plants — 4. *D.* sp. *A*

5 Fronds tripinnate; lamina deltoid to ovate-deltoid; rhizome and stipe base scales dark brown with entire margins; costules with ovate, bullate scales — 5. *D. kilemensis*
Fronds bipinnate (rarely tripinnate); lamina lanceolate-ovate to ovate; rhizome and stipe base scales various; costules with scales lanceolate or narrower, bullate or not — 6

6 At least some lower stipe scales dark brown with pale margins; fronds with shortly-aristate, spreading teeth on margin — 6. *D. callolepis*
Lower stipe scales uniformly coloured; fronds with short, nonaristate, incurved teeth on margin — 7

7 Stipe bases swollen, polished black with caducous scales; lower stipe scales much paler than the dark brown rhizome scales; rhizome and stipe scales with ± entire margins; pinnules of middle pinnae ± parallel sided, with truncate lobes and rounded apices — 7. *D. schimperana*
Stipe bases swollen or not, brown, scales usually persistent; lower stipe scales similar in colour to the rhizome scales; rhizome and stipe scales with entire to ciliate or lacerate margins; pinnules of middle pinnae lanceolate to lanceolate-ovate, with rounded to subtruncate lobes and acute to acuminate apices — 8

8 Rhizome scales pale brown; stipe base scales with numerous lateral processes; costules with long, pale, twisted, hair-like scales beneath, bullate scales absent; indusium persistent — 8. *D. inaequalis*

Rhizome scales dark brown; stipe base scales entire or with one to several lateral processes; costules with lanceolate, bullate scales beneath; long, twisted, hair-like scales absent; indusium persistent or caducous 9. *D. pentheri*

1. Dryopteris manniana (*Hook.*) *C. Chr.*

Fronds with one to several gemmae present on the upper part of the rachis (in our area); large fronds may have an additional gemma near the apex of each basal pinna; pinnules of the middle pinnae rounded at the apex.

This plant grows in dense shade in moist, montane forests, 5000–7500 ft. It is common east of the Rift valley. HA, HK, HN, MUM. Also in the Taita and Sagala hills and on Mt. Kasigau. Verdcourt and Polhill 2929; Faden 69/020.

2. Dryopteris squamiseta (*Hook.*) *O. Kuntze*

Lamina tripinnate, ovate and thin-textured; pinnule lobes rounded; sori large with a persistent indusium.

This is primarily a plant of the moister parts of the bamboo zone, occasionally extending down into moist, montane forest. It occurs in dense shade, 6900–9500 ft. HA, HK.

Faden *et al.* 69/765; Verdcourt 2050.

3. Dryopteris athamantica (*Kunze*) *O. Kuntze* (see p. 47)

Rhizome subterranean, frequently branched: characters not found in other Kenya species of *Dryopteris.* Fronds about 1 m tall, with the pinnule lobes often somewhat falcate.

This is the only grassland species of *Dryopteris.* It occurs in moist, broad-leaved, deciduous, wooded grassland (*Terminalia mollis* a characteristic tree) in the Kitale area. The buried rhizome is a protection against fire. KIT.

Tweedie 2855; Faden 70/898.

4. Dryopteris *sp.* **A.**

Fronds about 40 cm long; rhizome scales light brown. The taxonomic status of this plant remains uncertain; it is most closely related to *D. inaequalis.*

The single collection is from shaded stream banks in moist, intermediate forest at about 5250 ft. MUM (Kakamega forest).

Faden 69/2054.

5. Dryopteris kilemensis (*Kuhn*) *O. Kuntze*

This is the largest and perhaps most common species of *Dryopteris* in Kenya. The fronds can reach a length of about 2 m and a width of nearly half that. The rhizome is thick and ascending.

This plant is common in moist, montane forests and in the bamboo zone. It occurs in dense shade, about 6500–9800 ft. HA, HK, HN, KIS. Also in the Taita hills.

Napper 647; Faden and Holland 71/871.

6. Dryopteris callolepis *C. Chr.*

Rhizome scales with entire margins; fronds generally up to 70 cm long; pinnules often with a tendency to curl; indusium persistent.

This is a species of the bamboo, ericaceous and *Hagenia–Hypericum* zones, occurring in shade, about 8300–10 350 ft. HA, HK.

Fries 2554; Faden 71/883.

7. Dryopteris schimperana (*A. Br.*) *C. Chr.*

Rhizome and stipe base scales with ± entire margins (sometimes with one lateral process); scales on undersides of costules lanceolate, never bullate. Neither the name nor the circumscription of this species is very certain.

Extending from moist, montane forests into the moorland. Recorded 6850–11 200 ft. HE, HA, HK.

Faden and Evans 69/802; Coe and Kirika 396.

8. Dryopteris inaequalis (*Schlechtend.*) *O. Kuntze*

In eastern Kenya this is a clearly circumscribed species both morphologically and ecologically. The pinnae may be spreading or strongly erect (when growing in full sun). The freshly cut rhizome shows dark streaks in longitudinal section.

This is a plant of moist, forest edges at medium altitudes. It sometimes grows on roadside banks. It is found in partial shade or full sun. Occurs 4900–8200 ft. HA, HN, KIT, KIS, MAC. Also in the Taita hills.

Faden, Evans, and Worth 69/649; Faden and Evans 69/191.

9. Dryopteris pentheri (*Krasser*) *C. Chr.*

The bullate scales on the costules distinguish this from all other Kenya *Dryopteris* species except *D. kilemensis* which has a broader, more dissected lamina. Fronds grow to about 1·5 m tall and are bi- to tripinnate. The freshly-cut rhizome lacks dark streaks in longitudinal section.

This is a plant of moist, montane forests and the bamboo zone. It grows in dense shade, about 6750–8350 ft. HA, HM, HK.

Faden 71/68, 69/907.

37. HYPODEMATIUM *Kunze*

Small to medium-sized, terrestrial herbs; rhizome short-creeping, densely covered with long, narrow, lustrous, brown scales; fronds tufted; stipes scaly at base, finely hairy above, with 2 vascular strands;


Dryopteris athamantica

lamina ovate-deltoid, bi- to tripinnate, finely and densely hairy on both surfaces and on the axes; venation free; sori slightly elongate to somewhat curved, dorsal on the veins; indusium large, reniform, but usually asymmetrical, densely and finely hairy, persistent.

Hypodematium crenatum (*Forssk.*) *Kuhn*

The absence of scales on the lamina and axes easily distinguishes this species from all similar looking ones.

This plant grows in rock crevices. It has been collected only once in Kenya. KIS (Kanam, Mt. Homa, altitude 4000 ft).

Turner in CM/3632.

38. PHANEROPHLEBIA *Presl*

Medium-sized terrestrial herbs; rhizome erect, densely scaly; fronds tufted; stipes with several vascular bundles arranged in a U-shape; lamina oblong, pinnate with 5–9 pairs of pinnae, margin finely serrate; venation reticulate without included veinlets; sori round, numerous and scattered on the pinnae but often in apparent rows; indusium round, peltate.

Phanerophlebia caryotidea (*Hook. & Grev.*) *Copel.* (see p. 59)

This plant resembles a weak, thin-textured form of the cultivated Holly Fern (*Phanerophlebia* (*Cyrtomium*) *falcata*).

This is a rare forest plant occurring 5000–6000 ft. HA, MUM, KIS, EMB, NBI.

Faden 69/2105; Agnew 7934.

39. POLYSTICHUM *Roth*

Medium to large, terrestrial herbs; rhizome thick, woody, erect to ascending, densely scaly; fronds tufted; stipes densely scaly, with several vascular bundles arranged in a U-shape; lamina lanceolate, bipinnate, the pinnules unlobed to bipinnatifid; margin toothed, the teeth often aristate; axes densely scaly and hairy; venation free; sori round, dorsal on the veins; indusium round, peltate, persistent.

1 Pinnules toothed to shallowly lobed; teeth aristate; rachis never gemmiferous — 1. *P. fuscopaleaceum*
  Pinnules pinnatifid to bipinnatifid; teeth not aristate; rachis gemmiferous — 2
2 Pinnules rounded at apex, pinnatifid — 2. *P. magnificum*
  Pinnules acute at apex, bipinnatifid — 3. *P. volkensii*

1. Polystichum fuscopaleacum *Alston*

Pinnules with long marginal bristles.

This plant grows in dense shady moist montane forests, especially along streams and rivers, from 5000 ft up to the moorland at 13 500 ft. The plants at lower altitudes constitute a distinct variety with long attenuate apices of pinnae and dark brown scales on the rachis, while the high-altitude variety has abruptly acute pinnae and pale scales. Widespread and local it is often common at high altitudes. HE, HC, HM, HA, HK, HN, KIS, ?KIT, EMB, ?KAJ.

Hedberg 1933; Faden 70/114; Faden 71/464; Verdcourt and Moggi 2486.

2. Polystichum magnificum *Ballard*

Fronds up to 110 cm long and 25 cm wide; stipe base scales golden-brown or straw-coloured, up to 3 cm long and 0·9 cm wide.

This plant is known in East Africa only from moorland in the crater of Mt. Elgon at 11 500 ft. It has been collected only once on the Kenya side of the border. HE.

Tweedie s.n. (Nov. 1932).

3. Polystichum volkensii (*Hieron.*) *C. Chr.* (*P. barbatum* C. Chr.) (see p. 59)

A beautiful fern with fronds growing to at least 1 m tall. The finely dissected, gemmiferous fronds are unmistakable.

This plant is known in Kenya only from Mt. Kinangop at about 10 800 ft. It occurs in the *Hagenia–Hypericum* zone. HA. Elsewhere only on Kilimanjaro.

Fries 2735; Rabb and Nightingale 7.

40. ARACHNIODES *Blume*

Medium-sized terrestrial herbs; rhizome woody, short-creeping, densely scaly; fronds tufted to shortly-spaced; stipes arcuate-ascending, with several vascular bundles arranged in a U-shape; lamina deltoid to ovate-deltoid, bi- to tripinnate; marginal teeth aristate; venation free; sori round, dorsal to subterminal on the veins; indusium round-reniform.

Arachniodes foliosa (*C. Chr.*) *Schelpe*

An attractive fern with numerous, pale, narrow scales and hairs on the axes and costules.

This plant is frequent in wet forests, occurring 5000–8500 ft. HE, HT, HM, HA, HK, HN, RV, EMB, KAJ. Also in the Taita hills and on Mt. Kasigau.

Hedberg 151; Faden 71/875.

41. CTENITIS *C. Chr.*

Medium to large, terrestrial herbs; rhizome woody, erect to ascending (in our species), densely scaly; fronds tufted (in our species); stipes with several vascular bundles arranged in a U-shape; lamina pinnate to tripinnate; axes with scattered bullate

scales (in our species) and with numerous multicellular hairs; venation free; sori round, dorsal or terminal on the veins; indusium round-reniform, slightly hairy.

1 Fronds lanceolate to lanceolate-elliptic, pinnate, the pinnae deeply pinnatifid; sori dorsal on the veins 1. *C. cirrhosa*
Fronds deltoid, tripinnate at base, bipinnate in the middle; sori terminal on the veins 2. *C. lanuginosa*

1. Ctenitis cirrhosa (*Schumach.*) *Ching*

Stipe covered (more densely towards the base) with spreading, dark brown, hair-like scales; pinnae oblong-lanceolate, up to 20 cm long.

This is a rare plant in our area, occurring in shady places near streams in moist, intermediate forests, about 4900–5500 ft. EMB, MUM. Also in the Taita hills.

Faden 69/1981; Balbo 815.

2. Ctenitis lanuginosa (*Kaulf.*) *Copel.*

Rhizome thick, erect, bearing large (to about 2 m tall), softly hairy fronds; lamina finely-dissected, thin-textured.

This uncommon plant occurs in dense shade along streams in moist, montane forests, about 4900–7300 ft. HA, HK, HN. Also in the Taita hills and on Mt. Kasigau.

Faden *et al.* 69/763; Faden, Evans, and Worth 69/683.

42. TECTARIA *Cav.*

Medium-sized terrestrial herbs; rhizome woody, erect to ascending (in our plant), densely scaly; fronds tufted (in our plant); stipes with several vascular bundles arranged in a U-shape; lamina ovate (in our plant), bipinnate at the base, bipinnatifid above; costae very finely hairy above and below; venation reticulate with included veinlets; sori round; indusium round-reniform.

Tectaria gemmifera (*Fée*) *Alston* (see p. 50)

This plant can be recognized by the presence of gemmae or their scars on the upper surface of the rachis at junctions with costae. They sometimes occur on the lower surface as well. The lamina is ovate.

This is a common forest plant, 3900–8200 ft. HT, HM, HA, HK, HN, KIT, MUM, EMB, MAC, KAJ. Also in the Taita hills and on Mts. Kasigau and Marsabit.

Tweedie 2926; Faden 68/770.

43. ELAPHOGLOSSUM *J. Sm.*

Small to medium-sized, terrestrial or epiphytic herbs; rhizome erect or creeping, densely scaly; fronds tufted or spaced, usually dimorphic; stipes articulated a short distance above the base, leaving peg-like phyllopodia when they fall; lamina simple, spathulate to linear, most commonly oblong to oblong-elliptic, often densely scaly; margin entire; venation free; fertile laminae usually different in size and/or shape from the sterile laminae; sporangia covering the entire lower surface of the fertile laminae; indusium absent.

1 Sterile lamina without scales or with minute, dot-like scales only, margins never scaly 2
Sterile lamina scaly on the margins and/or surfaces 5

2 Rhizome scales reddish-brown; fronds shortly spaced on the rhizome, coriaceous, to 5 cm wide; frond apex always round; sterile lamina at least 1·5 times as wide as the fertile lamina 1. *E. lastii*
Rhizome scales pale to dark brown; fronds shortly to widely spaced on the rhizome, firmly herbaceous, to 3·5 cm wide; frond apex acute to acuminate (sometimes obtuse in some specimens of *E. conforme*); sterile lamina usually less than 1·5 times as wide as the fertile lamina (sometimes more in *E. acrostichoides*) 3

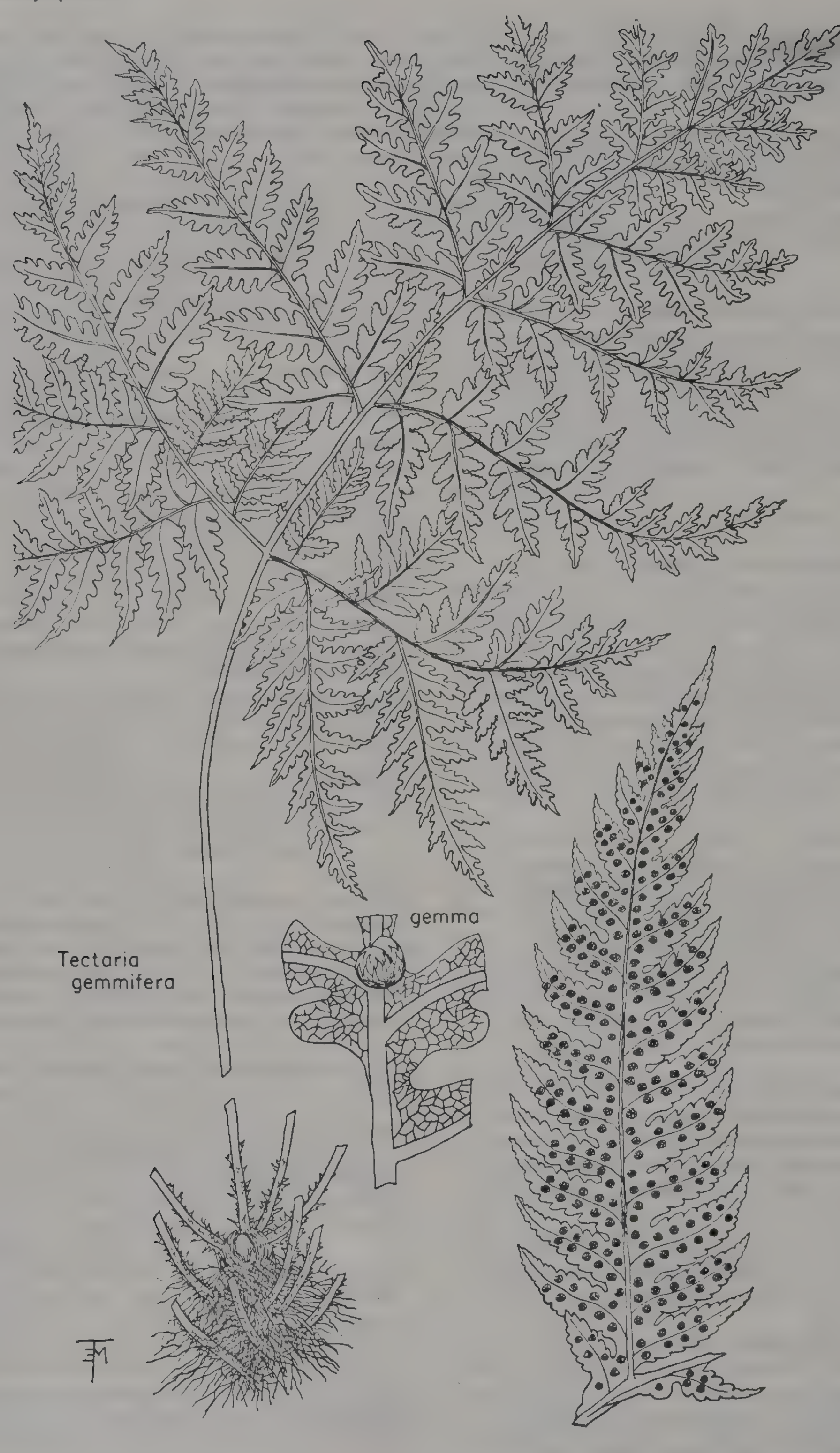
3 Rhizome scales ovate, appressed, light brown; sterile lamina with a conspicuous translucent margin about 0·5 mm broad; apex acuminate 2. *E. angulatum*
Rhizome scales lanceolate, spreading, medium brown to dark brown; sterile lamina without a translucent margin; apex acuminate to obtuse 4

4 Frond apex acuminate; rhizome scales dark brown 3. *E. acrostichoides*
Frond apex acute to obtuse; rhizome scales medium brown 4. *E conforme*

5 Scales on lamina with entire or serrulate margins, not forming a mat on the lamina 6
Scales on lamina with conspicuously ciliate margins, often forming a mat on the lamina 9

6 Sterile lamina linear, with conspicuous, black, submarginal hydathodes on the upper surface; stipe of sterile frond 0·2–0·4 (–0·7) times the length of the lamina 5. *E. aubertii*
Sterile lamina elliptic to oblong or lanceolate-oblong, or oblanceolate to spathulate; hydathodes absent or not clearly seen; stipe of sterile frond 0·5–1·5 times the length of the lamina 7

7 Sterile lamina oblanceolate to spathulate; fronds up to 8 cm long and 0·9 cm wide 6. *E. spathulatum*


gemma
Tectaria
gemmifera

Sterile lamina elliptic to oblong or lanceolate-oblong; fronds 8–50 cm long and 2–5 cm wide — 8

8 Rhizome scales blackish; scales of the sterile lamina blackish and ± confined to the margins and midvein — 7. *E. hybridum*

Rhizome scales light brown; scales of the sterile lamina orange-brown, scattered on both surfaces — 8. *E. mildbraedii*

9 Rhizome thin, long-creeping with widely spaced fronds; rhizome scales 3–5 mm long; lamina of sterile frond 4–12 cm long — 9. *E. subcinnamomeum*

Rhizome thick, short-creeping with shortly spaced fronds; rhizome scales more than 5 mm long (sometimes shorter in *E. ruwenzorii*); lamina of sterile frond 15–100 cm long — 10

10 Lamina scales mostly honey-coloured; marginal hairs of stipe scales mostly shorter than the width of the scale — 10. *E. tanganjicense*

Lamina scales mostly reddish, or reddish on one surface and honey-coloured on the other; marginal hairs of stipe scales 1–2 times as long as the width of the scales — 11

11 Rhizomes scales with ± entire margins; sterile fronds of mature plants up to 40 cm long — 11. *E. ruwenzorii*

Rhizome scales ciliate; sterile fronds 40–100 cm long — 12. *E. deckenii*

1. Elaphoglossum lastii (*Bak.*) *C. Chr.* (*E. volkensii* Hieron., *E. convolutum* Chiov.)

Fronds up to 70 cm in length; sterile lamina either shorter or longer than the stipe; fertile fronds usually longer than the sterile fronds.

This common species is an erect epiphyte, usually growing high up on trees (rarely low or terrestrial). It tends to be gregarious, and grows in moist, montane forests, 4900–8500 ft. HM, HA, HK, KIS. Also in the Taita hills and on Mt. Kasigau.

Verdcourt, Polhill, and Lucas 3036A; Balbo 769.

2. Elaphoglossum angulatum (*Blume*) *Moore*

Fronds up to 35 cm long; sterile lamina oblong-elliptic and, in large plants, equalling or slightly exceeding the stipe in length; fertile lamina similar in shape to the sterile one but somewhat smaller.

This rare plant is terrestrial or epiphytic. It occurs in the bamboo and ericaceous zones, 8000–8500 ft. HA, HK.

Faden and Evans 70/89; Faden 71/201.

3. Elaphoglossum acrostichoides (*Hook. & Grev.*) *Schelpe*

This is easily recognized, being the only *Elaphoglossum* in our area with non-scaly laminae attenuate at both ends. The fronds may be shortly or widely spaced on the rhizome, and they are up to 50 cm in length.

This species occurs in moist, montane forest. It is almost always epiphytic, and frequently occurs with *E. lastii*, but is less common than that species. Occurs about 5750–8500 ft. HA, HK, HN, KIT, KIS. Also in the Taita hills.

Faden and Evans 69/545; Faden and Cameron 72/309.

4. Elaphoglossum conforme (*Swartz*) *Schott*

Rhizome thin, with the widely spaced fronds usually 20–30 cm long; lamina oblong-elliptic to narrowly elliptic.

This is a species of the ericaceous and *Hagenia–Hypericum* zones. It is apparently terrestrial along streams and has been collected at 9000 ft. HA, HK.

Schelpe 2302; Agnew 9060.

5. Elaphoglossum aubertii (*Desv.*) *Moore* (see p. 26)

Sterile fronds normally about 30 cm long; fertile fronds with shorter laminae and longer stipes than sterile fronds. The narrow, sterile fronds with short stipes and scattered brown scales on the laminae readily distinguish this species.

Moist, montane forest is the habitat of this plant. It is terrestrial or epiphytic (seldom more than 5 m above the ground) and usually occurs near streams in dense shade. Recorded 4900–8500 ft. HA, HK, KIS. Also occurs on Mt. Kasigau.

Faden *et al.* 69/528; Faden and Grumbley 72/340.

6. Elaphoglossum spathulatum (*Bory*) *Moore*

The small size of the fronds and their shape make this species unmistakable. The fronds are ± tufted. The fertile lamina is ovate-elliptic and is shorter than the sterile lamina.

The single Kenya collection of this species came from a moss- and liverwort-covered rock about 1·5 km downstream from the Sasumua Dam, at 8000 ft. HA.

Faden 71/74.

7. Elaphoglossum hybridum (*Bory*) *Brack.*

Fronds clustered on the rhizome and generally 20–30 cm long; sterile lamina oblong to oblong-elliptic; fertile lamina smaller, longer-stalked, lanceolate-elliptic. Even small, sterile plants are

easily recognized by the black scales on the margin and along the midvein.

This species extends from the moist montane forest up into the moorland. It is usually terrestrial and is found along streams or beside waterfalls. It occurs 6500–11 000 ft. HE, HA, HK, KIS.

Hedberg 904; Faden and Grumbley 72/350.

8. Elaphoglossum mildbraedii *Hieron.*

Sterile fronds up to 43 cm long, but some fertile plants with much smaller fronds; sterile lamina oblong-elliptic to 21 cm long and 4·5 cm wide with the apex acuminate (large plants) or rounded (small plants); fertile frond much shorter than sterile frond and with much shorter lamina.

This is a plant of moist, shaded, rock crevices and grows in moist, montane forest along rivers at 6500 ft. It is found in the Kericho area, below Salt Lick Falls on the Kiptoget River. KIS.

Faden and Grumbley 72/334.

9. Elaphoglossum subcinnamomeum (*Christ*) *Hieron.*

This plant is easily recognized by its small fronds with ciliate, greyish scales on the narrowly elliptic laminae. Terrestrial and commonly growing on rocks, this is primarily a moorland plant, extending down into either the ericaceous or *Hagenia–Hypericum* zone, occurring 9800–11 500 ft. HE, HK.

Hedberg 993; Schelpe 2605.

10. Elaphoglossum tanganjicense *Pic. Ser.*

Fronds flaccid, to 100 cm long, 5 cm wide; apex often obtusely acute; fertile lamina shorter and much narrower than the sterile lamina.

This is a pendent epiphyte in moist, montane forests. It is very common in the south-west Mau forest along the larger rivers but occurs nowhere else in our area. Occurs in Kenya 4900–7500 ft. HM, KIS. Also on Mt. Kasigau.

Kerfoot 4034; Faden and Grumbley 72/339.

11. Elaphoglossum ruwenzorii *Pirotta*

The smaller fronds with somewhat sparser scales and more abruptly acuminate apices serve to distinguish this species from *E. deckenii*. The two may prove to be conspecific.

This is a terrestrial or epiphytic plant, occurring primarily in moist, montane forests and the bamboo zone, occasionally extending up into the ericaceous zone. Occurs about 7200–8500 ft. HM, HA, HK.

Faden and Evans 70/99; Bally 4897.

12. Elaphoglossum deckenii (*Kuhn*) *C. Chr.*

Apex of sterile lamina acute or acuminate; fertile fronds always shorter than the sterile fronds.

This appears to be a plant primarily of the ericaceous and *Hagenia–Hypericum* zones. It can be either a pendulous epiphyte or terrestrial. Occurs 8000–10 800 ft., but is rare below 9000 ft. HE, HA, HK.

Hedberg 1635; Fries 2726.

44. LOMARIOPSIS *Fée*

Medium-sized herbs rooted in the ground but the rhizomes typically climbing trees; rhizomes elongate, dorsiventral, scaly; fronds widely spaced, dimorphic; stipes decurrent on the rhizome, with several vascular bundles arranged in a U-shape; lamina pinnate, lateral pinnae articulated to the rachis; venation free; fertile fronds with very contracted pinnae; sporangia covering the lower surface of the fertile pinnae; indusium absent.

Lomariopsis warneckei (*Hieron.*) *Alston*

This plant, which has fronds to 100 cm long with 14–19 pairs of oblong pinnae, has not yet been observed climbing trees (in our area), although Faden 69/2024 is fully fertile.

This is a moist forest plant of deep shade known in our area only from the Kakamega forest and south-east Mt. Kenya, 5250–6250 ft. HK, MUM. Also occurs in the Taita and Sagala hills and on Mt. Kasigau.

Faden 70/7, 69/2024.

45. BOLBITIS *Schott*

Small or medium-sized, terrestrial herbs; rhizome long-creeping (in our plant), scaly; fronds spaced, dimorphic; stipes with several vascular bundles; blade pinnate to pinnate-pinnatifid (in our plant), glabrous; venation reticulate; fertile fronds similar in cutting to sterile fronds but smaller; sporangia covering the entire lower surface of the fertile pinnae; indusium absent.

Bolbitis heudelotii (*Fée*) *Alston*

A dark green, fleshy plant growing to 70 cm tall and occurring in colonies. Much smaller, deeply bipinnatifid, submerged fronds are known from outside our area.

This plant grows on rocks in rivers; known in Kenya only from the Isiukhu River at the northern edge of the Kakamega forest (altitude 5300 ft). MUM.

Faden 69/2101.

46. THELYPTERIS GROUP (*Thelypteridaceae*)

Medium to large, terrestrial herbs; rhizome erect to long-creeping, densely or sparsely scaly; rhizome scales not clathrate, usually ciliate; fronds tufted to widely spaced; stipes with two vascular strands near the base, uniting above to form one U-shaped

strand; lamina usually hairy, rarely with scales (*Thelypteris confluens*), usually pinnate (bipinnate in *Macrothelypteris*), the pinnae lanceolate or oblong-lanceolate to linear and regularly crenate, pinnately lobed or deeply pinnatifid; venation free (*Macrothelypteris, Leptogramma, Thelypteris*), or one or more pairs of veinlets joined below the sinuses (*Ampelopteris, Cyclosorus*); sori round or slightly elongate, dorsal on the veins; indusium absent or round-reniform, persistent or caducous.

The generic limits in the Thelypteridaceae are currently in a state of flux. Hence the above description is of the family, not of any particular genus. The generic limits used here are those Alston (1959) with the exception of *Macrothelypteris* being segregated from *Thelypteris.*

1 Fronds bipinnate; stipe bases of young fronds with numerous, spreading scales which are colourless in living plants but turn brown on drying — 1. *Macrothelypteris aubertii*
Fronds pinnate; stipe bases without scales or with appressed, brown scales only — 2

2 Fronds arching and producing gemmae and young plants on the rachis at irregular intervals; lamina glabrous; several pairs of veinlets united below the sinuses; paraphyses present (dissecting microscope required) — 2. *Ampelopteris prolifera*
Fronds either not gemmiferous or, if so, then producing a single gemma on the upper part of the rachis; lamina usually hairy; veinlets free or united; paraphyses absent — 3

3 One or more pairs of veinlets joined below the sinus (*Cyclosorus*) — 4
Veinlets all free, the lowest pair sometimes meeting at the sinus — 9

4 Rhizome erect; fronds gemmiferous; 2–4 pairs of veinlets joined below the sinus — 3. *Cyclosorus madagascariensis*
Rhizome erect or short- to long-creeping; fronds not gemmiferous; 1–2 pairs of veinlets joined below the sinus — 5

5 Two pairs of veinlets joined below the sinus; pinnae cut one-quarter to one-third the distance to the costa; rhizome long-creeping — 4. *C.* sp. *A*
One pair of veinlets joined below the sinus; pinnae cut one-third to three-quarters the distance to the costa; rhizome long-creeping, short-creeping or erect — 6

6 Rhizome long-creeping with widely spaced fronds; costae glabrous or sparsely hairy above; plants usually of swamps and marshes — 7
Rhizome short-creeping or erect; fronds shortly-spaced or tufted; costae densely hairy above; plants of forests or stream banks, but rarely of swamps or marshes — 8

7 Pinnae cut one-third to one-half the distance to the costa; pinna lobes triangular, pointed — 5. *C. interruptus*
Pinnae cut one-half to three-quarters the distance to the costa; pinna lobes oblong, rounded — 6. *C. striatus*

8 Rhizome erect or ascending; fronds tufted; lower pinnae only slightly reduced, the lowermost never auriculiform; united veinlets below the sinuses always meeting at an obtuse angle — 7. *C. quadrangularis*
Rhizome short-creeping; fronds shortly spaced; lower pinnae gradually reduced in size, the lowermost often reduced to auricles; united veinlets below the sinuses meeting at an acute or, less commonly, obtuse angle — 8. *C. dentatus*

9 Sori elliptic, exindusiate; sporangia ciliate (microscope required) — 9. *Leptogramma pozoi*
Sori all round, indusiate or exindusiate; sporangia not ciliate (*Thelypteris*) — 10

10 Fronds glabrous or nearly so; costae with ovate scales beneath; rhizome thin and long-creeping with widely spaced fronds — 10. *Thelypteris confluens*
Fronds hairy; costae without scales; rhizome erect, ascending or rarely long-creeping; fronds tufted or rarely widely spaced — 11

11 Lower pinnae ± abruptly reduced into a long series of auricles — 12
Lower pinnae only slightly reduced or gradually reduced and only the lowermost auriculiform — 13

12 Rhizome creeping; fronds spaced; indusium hairy — 11. *T. friesi*
Rhizome erect; fronds tufted; indusium glabrous — 12. *T. longicuspis*

13 Indusium large, persistent; lower few pairs of pinnae only slightly reduced (rarely regularly reduced and the lowermost auriculiform) — 14
Indusium absent or small and caducous; lower pinnae regularly and gradually reduced in size, the lowermost auriculiform — 15

14 Rhizome creeping; fronds spaced — 13. *T. chaseana*
Rhizome erect or ascending; fronds tufted — 14. *T. gueintziana*

15 Pinnae with hooked hairs on the undersides of the lobes; large, sessile, yellow or red glands absent from the costules on the lower surface; sori submarginal to medial on the lobes — 15. *T. bergiana*

Pinnae lacking hooked hairs beneath; large, sessile, yellow or red glands (sometimes very few) present on the lower surface of the costules; sori medial 16. *T. strigosa*

1. Macrothelypteris aubertii (*Desv.*) *Pic. Ser.* (see p. 31)

Rhizome erect with tufted fronds which reach 1·5 m long; pinnules with acuminate to attenuate apices; sori round, exindusiate.

This is an uncommon plant of moist, montane forests. It generally occurs along streams in dense shade. HA, HK, HN, KIS. Also in the Taita hills.

Faden 69/214; Faden, Evans and Worth 69/682.

2. Ampelopteris prolifera (*Retz.*) *Copel.*

Rhizome creeping with shortly spaced fronds, often of indeterminate growth; pinnae oblong with crenate or shallowly lobed margins; sori (not yet seen in our area) circular to elongate, exindusiate.

This plant occurs along rivers and in marshy places in full sun. The sole Kenya record is from just outside our area (along the Tana River at Seven Forks, about 3000 ft altitude).

Mrs. J. Brown s.n.

3. Cyclosorus madagascariensis (*Fée*) *Ching* (*C. patens* (Fée) Copel.) (see p. 26)

The large (generally 2–3 m long), gemmiferous fronds readily distinguish this species. The linear-oblong pinnae are crenate or shallowly lobed. The circular sori are subcostular and exindusiate.

This is a common plant of moist, montane forests and the bamboo zone. It is usually gregarious and grows along streams, 4900–8200 ft. HA, HK, HN, KIT, MUM, KIS. Also in the Taita hills and on Mount Kasigau.

Verdcourt and Polhill 2930; Faden and Grumbley 72/347.

4. Cyclosorus *sp.* **A.**

The widely spaced fronds have the lowest pinnae only slightly reduced. In the latter character this species resembles *C. quadrangularis* but that species has an erect rhizome with tufted fronds and only one pair of veins joined below the sinus.

This is a species of moist, intermediate or lowland forests. It occurs along streams in dense shade at about 5250 ft (in our area). MUM. Also in the Shimba hills.

Faden 70/23; Agnew and Musumba 8558.

5. Cyclosorus interruptus (*Willd.*) *H. Itô* (*C. tottus* (Thunb.) Pic. Ser., *C. gongylodes* (Schkuhr) Link)

Fronds coriaceous, normally 40–60 cm long; lower pinnae not reduced; rhizome black.

This is a gregarious plant of marshes, usually growing in full sun. It occasionally occurs along streams in forests. Uncommon in our area. HN, KIS, MAC. Also in the Taita hills and along the coast.

Faden, Evans, and Worth 69/652; Hanid and Kiniaruh 693.

6. Cyclosorus striatus (*Schumach.*) *Ching*

This species is very similar to *C. interruptus* and differs primarily in having larger fronds (to about 1·5 m tall) with larger, more deeply cut pinnae.

This is a plant of papyrus swamps, and occurs around Lake Victoria. MUM, KIS.

Agnew and Musumba 8603; Ayieko 65.

7. Cyclosorus quadrangularis (*Fée*) *Tard.*

Fronds normally 30–60 cm long, lanceolate to lanceolate-elliptic in outline. The frond shape and erect rhizome resemble *Thelypteris gueintziana* but that species has free veins.

This plant grows in moist, lowland or intermediate forests usually along streams. Apparently it is rare in our area. MUM (Kakemega forest). Also in the Taita and Shimba hills.

Faden 69/2012, 70/21A.

8. Cyclosorus dentatus (*Forssk.*) *Ching* (see p. 55)

This is the only species of *Cyclosorus* in our area with a short-creeping rhizome and the pinnae regularly decreasing in length towards the base of the frond. The lamina is narrowly elliptic in outline.

This common species grows along streams and in other wet situations in forests up to 6850 ft. It usually grows in partial shade but tolerates full sun. HE, HA, HK, KIT, MUM, KIS, MAG, EMB, MAC. Also in the Taita hills, on Mt. Kasigau and along the coast.

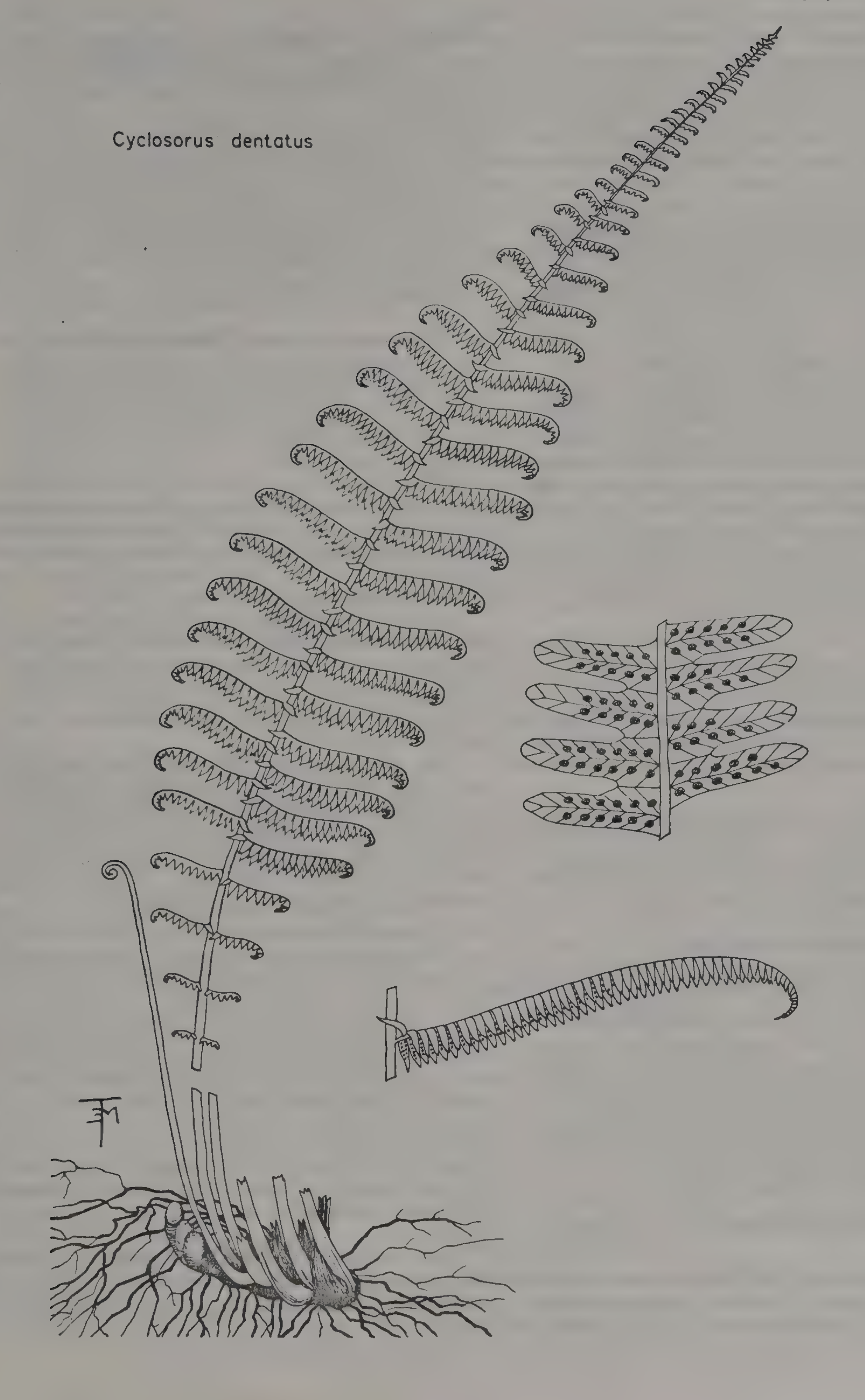
Faden 68/989; Verdcourt and Greenway 440.

9. Leptogramma pozoi (*Lagasca*) *Heywood*

Rhizome erect; fronds tufted, generally 25–40 cm long; the lower few pairs of pinnae decreasing in length towards the base of the frond but never auriculiform; middle pinnae lobed about halfway to the costae.

Although primarily a species of the bamboo zone, it extends down into the moist, montane forest and up into the ericaceous zone. It grows in dense shade from 6650–11 000 ft. HE, HC, HA, HK, KIS. Also in the Taita hills.

Turner 3225; Faden 70/931.


Cyclosorus dentatus

10. Thelypteris confluens (*Thunb.*) *Morton*

This is the only species of Thelypteridaceae in our area with scales on the lamina and with the veinlets of the sterile pinnules frequently forking before reaching the margin. The lower pinnae are only slightly reduced and the margins of the pinnules are often revolute.

This is a gregarious plant of marshes and river banks, growing in full sun or, less commonly, in partial shade, about 4000–6850 ft. HA, HN, KIT, MUM, MAC. Also in the Taita hills.

Verdcourt 429; Faden, Evans, and Worth 69/654.

11. Thelypteris friesii (*Brause*) *Schelpe*

This is our only species of *Thelypteris* with the pinnae greatly reduced towards the frond base which has a creeping rhizome. The occasional specimens which have the lower pinnae gradually instead of abruptly reduced can be distinguished from *T. bergiana* and *T. strigosa* by the creeping rhizome and persistent, hairy indusium.

This plant is known from only one locality in Kenya, the edge of a marsh at Sandum's Bridge near Kitale at 6000 ft. KIT.

Faden 71/458; Tweedie 2863.

12. Thelypteris longicuspis (*Bak.*) *Schelpe* (*T. zambesiaca* (Bak.) Tard.) (see p. 31)

This is the largest species of *Thelypteris* in our area with fronds up to 2 m long and 60 cm wide. The pinnae reach about 30 ×3 cm and are cut almost to the costae.

This species is widespread in Kenya but is nowhere common. It occurs along streams in forests at moderate altitudes. HE, HC, HK, HN, ?KIT, MUM, MAC. Also occurs in the Taita hills.

Faden 68/988; Isaac in EAH 12619.

13. Thelypteris chaseana *Schelpe*

This species is indistinguishable from the much more common *T. gueintziana* in the absence of the rhizome (see key). The lower pinnae are somewhat reduced but are never auriculiform.

Plants are recorded from two quite different habitats in Kenya: edge of a large marsh in partial shade (Sandum's Bridge, 6000 ft); along a small stream in dense shade in moist, intermediate forest (Taita hills, 4900 ft). KIT.

Tweedie 66/241; Faden 71/456.

14. Thelypteris gueintziana (*Mett.*) *Schelpe* (see p. 31)

Plants of this species look very similar to *Thelypteris chaseana* and *Cyclosorus quadrangularis*. For distinctions from the former see key. From the latter they may be separated by their free veins. Occasional plants may have the lowermost pinnae auriculiform and may be distinguished from *T. bergiana* and *T. strigosa* by the hairy, persistent indusium.

This is a common riverside plant at moderate altitudes, occurring in full sun or partial shade. It also occurs in other wet situations (e.g. moist, roadside banks), but it is apparently absent from undisturbed forests or open, marshy places. MUM, NAR, BAR, EMB, MAC, NBI. Also occurs in the Taita hills and on Mt. Kasigau.

Faden 68/832; Glover *et al.* 2608.

15. Thelypteris bergiana (*Schlechtend.*) *Ching*

Fronds to about 1·2 m tall and 25 cm wide. This plant is most readily distinguished from the very similar *T. strigosa* by its larger fronds (they do overlap in size however) on which the sori are frequently submarginal.

This is a common plant of moist, montane forests and the bamboo zone, occurring down to about 5900 ft. It is usually found along streams and rivers. HE, HA, HK, HN, KIT, KIS. Also in the Taita hills.

Faden 69/101; Faden and Pócs 71/900.

16. Thelypteris strigosa (*Willd.*) *Tard.* (see p. 31)

Fronds up to about 1 m long and 15 cm wide. Large plants must be studied carefully (preferably with a dissecting microscope) to distinguish them from *T. bergiana* (see key).

This plant occurs primarily in the bamboo zone, extending down into the montane forest and up into the ericaceous zone. It is commonly found along streams, often growing with *T. bergiana*, and is recorded 6250–9650 ft. HE, HT, HM, HA, HK, HN, KIT. Also in the Taita hills.

Faden 69/080; Faden *et al.* 69/762.

47. CYSTOPTERIS *Bernh.*

Small terrestrial herbs; rhizome short-creeping, densely scaly; fronds shortly spaced to tufted; stipes glabrous; lamina glabrous, lanceolate to narrowly elliptic, bipinnate or less commonly pinnate; venation free; sori ovate or round, dorsal on the veins; indusium cup-shaped, attached at the base of the receptacle and opening outwards.

Cystopteris fragilis (*L.*) *Bernh.*

Fragile fern or Brittle fern. Fronds delicate, thin-textured, acuminate, up to 30 cm in length; pinnae lanceolate, acuminate, acute or rarely obtuse at the apex.

This is primarily a plant of the bamboo zone and above, but has been recorded 5500–11 800 ft altitude in Kenya. HE, HT, HM, HA, HK, KIS, NBI.

Hedberg 898; Gardner 978.

48. ATHYRIUM *Roth*

Medium-sized terrestrial herbs; rhizome creeping or erect, somewhat fleshy, densely scaly; fronds tufted or spaced; stipes glabrous, scaly at the base, with two C-shaped vascular strands near the base, uniting above into a single U-shaped strand; lamina elliptic to lanceolate-elliptic, bi- to tripinnate, ± glabrous; margins sharply toothed; venation free; sori dorsal on the veinlets, either elongate on one side of the veinlet or else the distal end crossing the veinlet, making the sorus J-shaped or horseshoe-shaped; indusium attached to the veinlet and the same shape as the sorus, persistent.

1 Rhizome thin, creeping; fronds spaced, elliptic, mostly bipinnate 1. *A. schimperi*
 Rhizome thick, erect; fronds tufted, lanceolate-elliptic, mostly tripinnate 2. *A. scandicinum*

1. Athyrium schimperi *Fée*

Fronds about 25–40 cm long with the lower pinnae slightly reduced. The stipe base is brown.

This plant is known in Kenya from a single locality on Mt. Elgon at about 7850 ft. It was found at the edge of montane forest with *Juniperus procera* and *Olinia usambarensis* being two common trees. HE.

Tweedie 1882; Faden 71/452.

2. Athyrium scandicinum (*Willd.*) *Presl* (see p. 59)

Fronds very variable in size, reaching at least 1·2 m in length, but sometimes fertile when no more than 20 cm long. The stipe bases are pink or green. Two ± distinct varieties may be recognized, one with stipe bases pink is the typical one, the other has green stipe bases.

The first is primarily a plant of the bamboo zone but extends down along rivers and streams into the montane forest and up into the ericaceous zone, occurring 5250–9800 ft. HA, HK, MUM, KIS.

Faden 70/104; 69/1977.

The variety with green stipe bases tends to have the marginal teeth more spreading and the pinnules broader, longer-stalked and more obtuse than the typical variety. It does not extend into the montane forest and is recorded 8300–10 500 ft. HA, HK.

Faden 69/078; Schelpe 2716.

49. DIPLAZIUM *Swartz*

Large terrestrial herbs; rhizome thick, erect to ascending, densely scaly; fronds tufted; stipes glabrous, swollen just above the base, with two C-shaped vascular strands near the base, uniting above into a single U-shaped strand; lamina ovate, bipinnate (in our species), the pinnules deeply pinnatifid or bipinnatifid, ± glabrous; margins toothed; venation free (in our species); sori elongated along the veinlets, elliptic to linear, either on one or both sides of the veinlet; indusium the same shape as the sorus and attached to the veinlet, caducous or persistent.

1 Fronds of mature plants bipinnate-pinnatifid; sori mostly oblong 1. *D. hylophilum*
 Fronds bipinnate-bipinnatifid; sori mostly elliptic or oblong-elliptic 2
2 Indusium never completely covering the sorus, not splitting, caducous 2. *D. zanzibaricum*
 Indusium completely covering the sorus, splitting irregularly, persistent 3. *D. velaminosum*

1. Diplazium hylophilum (*Hieron.*) *C. Chr.*

Fronds about 1·2 m long; pinnules lanceolate with acuminate apices; indusium broad and persistent.

This is a rare species of moist, montane forests and occurs in dense shade in swampy spots, about 5000–6250 ft. HK. Also occurs in the Taita hills.

Faden and Holland 72/193.

2. Diplazium zanzibaricum (*Bak.*) *C. Chr.*

Fronds large (about 1·5 m long); pinnules oblong with attenuate apices; sori about 1–1·5 mm long.

This is an uncommon plant of moist, montane forests. HK, HN; also in the Taita hills.

Faden, Evans, and Worth 69/665; Faden *et al.* 69/764.

3. Diplazium velaminosum (*Diels*) *Pic. Ser.* (see p. 59)

The fronds are almost identical to those of *D. zanzibaricum* in size and cutting, and it is somewhat doubtful whether this represents a good species.

This plant grows along streams in dense shade of moist, intermediate forests. It is known in Kenya only from the Kakamega forest. MUM.

Faden 69/1976, 70/10.

50. DRYOATHYRIUM *Ching*

Large terrestrial herbs; rhizome erect, densely scaly; fronds tufted; stipes swollen just above the base, with two C-shaped vascular strands at the base, uniting above into a single U-shaped strand; lamina ovate, bipinnate, the pinnules deeply pinnatifid to bipinnatifid; venation free; sori dorsal on the veinlets, round or ovate; indusium ovate to round-reniform.

Dryoathyrium boryanum (*Willd.*) *Ching* (see p. 59)

This species has large (to 1·5 m long), thin-textured fronds which closely resemble those of

Diplazium zanzibaricum from which they differ chiefly in the shape of the sori.

This is a widespread, but uncommon, moist-forest plant, usually found along streams, 4750–8350 ft. HM, HA, HK, HN, MUM, KIS, MAC.

Faden 69/2026; Glover, Gwynne, and Samuel 1167.

51. BLECHNUM *L.*

Medium-sized, terrestrial or epiphytic herbs (rarely small trees); rhizome erect, sometimes forming a trunk, densely scaly; fronds tufted to slightly spaced, dimorphic; stipes with several vascular strands; lamina pinnate to deeply pinnatifid; margin entire to serrate, often revolute; venation free, veins parallel, once or twice forked; fertile pinnae contracted; sori linear, close to and parallel to the costa or nearly covering the whole undersurface of the contracted, fertile pinnae; indusium linear, opening towards the costa, rarely vestigial.

1 Bases of middle and lower sterile pinnae not adnate to the rachis — 1. *B. australe*
  Bases of middle and lower sterile pinnae adnate to the rachis — 2
2 Sterile pinnae narrowed at the base; bases of middle sterile pinnae quite separate from each other; rhizome usually trunk-like — 2. *B. tabulare*
  Sterile pinnae broadest at the base; bases of middle sterile pinnae in contact with each other; rhizome not trunk-like — 3
3 Margins entire; fronds coriaceous, to 150 cm long, slightly spaced on an elongate rhizome — 3. *B. attenuatum*
  Margins crenulate; fronds herbaceous, to 35 cm long, tufted on a short rhizome — 4. *B. ivohibense*

1. Blechnum australe *L.*

Fronds up to 40 cm long and 8 cm wide; pinnae mucronate at the apex. Fronds may have all pinnae sterile, all fertile or the upper fertile and the lower sterile.

This plant is terrestrial in the bamboo zone and is very local, occurring at about 8000 ft. HM, HA.

Cameron 18; Faden 71/71.

2. Blechnum tabulare (*Thunb.*) *Kuhn*

Rhizome to about 100 cm tall and 10 cm in diameter; rhizome scales linear-lanceolate, up to 3·5 cm long; fronds dimorphic, 50–100 cm long with oblong pinnae.

This terrestrial species occurs principally in the bamboo zone but is also recorded from one locality in the ericaceous zone. In partial or dense shade, at about 8000–8500 ft. HA, HK.

Faden and Evans 69/903; Faden *et al.* 69/539.

3. Blechnum attenuatum (*Swartz*) *Mett.*

Fronds with the pinnae gradually reduced towards the base with the lowermost auriculiform; middle pinnules acuminate and distinctly broadened at the base.

Plants are either terrestrial, or else the rhizomes climb tree fern trunks (to a height of at least 5 m) and bear fronds only at the summit. This is the common *Blechnum* in Kenya, occurring in moist, montane forests and the bamboo zone. HM, HA, HK, KIS. Also in the Taita hills and on Mt. Kasigau.

Bally 4814; Faden and Grumbley 72/345.

4. Blechnum ivohibense *C. Chr.*

Lower pinnae reduced but not auriculiform (in our area); middle pinnae up to 4 cm long; young fronds often reddish.

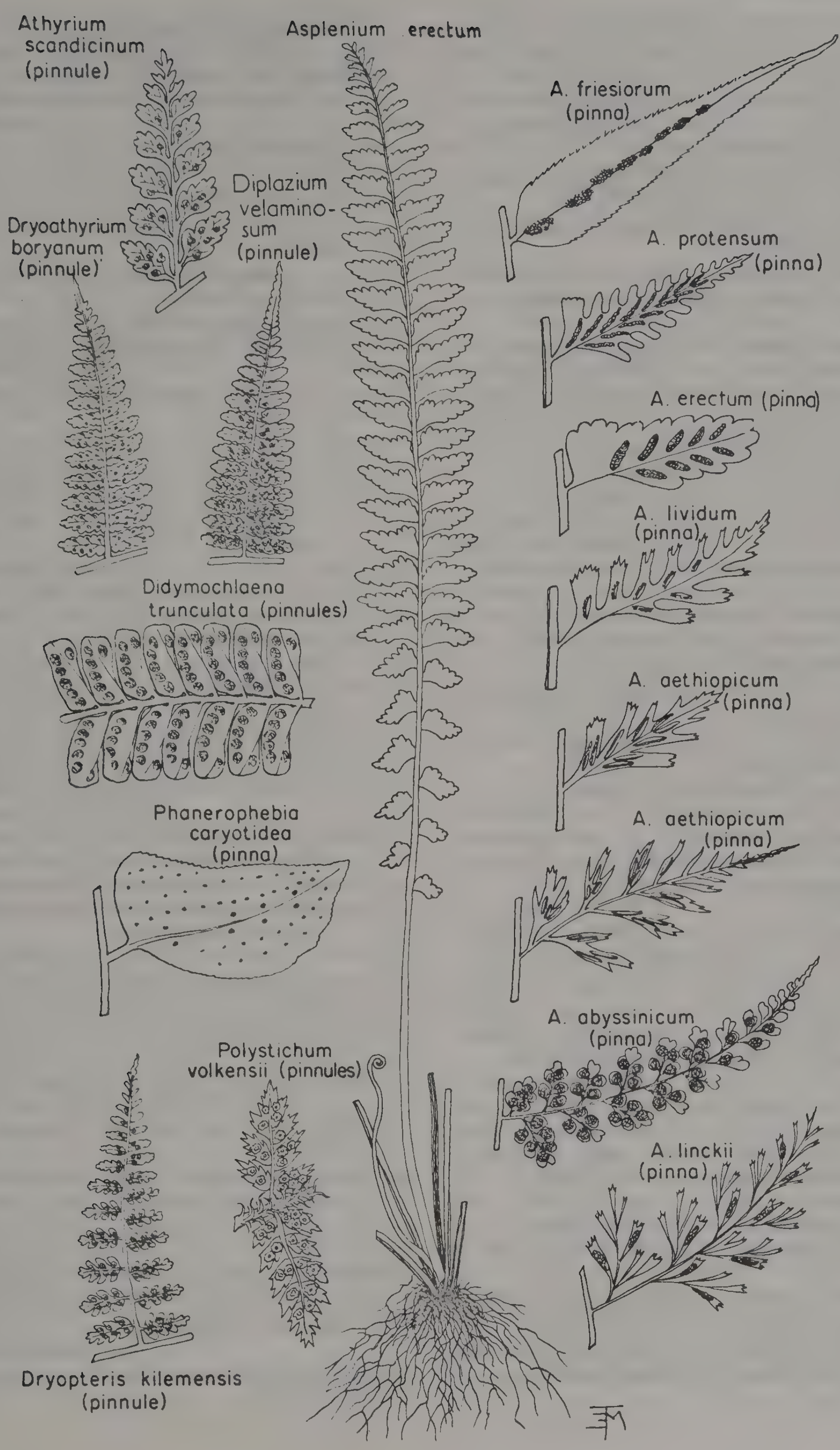
This terrestrial species is known from only one locality in our area: the base of volcanic cone Kirui, north-east Mt. Kenya. It grows in moist, montane forests. HK. Also in the Taita hills and on Mt. Kasigau.

Faden *et al.* 69/773, 69/495.

52. ASPLENIUM *L.*

Small to medium, terrestrial or epiphytic herbs; rhizome erect to long-creeping, densely covered with clathrate scales; fronds tufted to widely spaced; stipes with two vascular strands near the base, uniting above to form an X-shape; lamina simple to quadripinnate, with sparse to dense clathrate scales; venation free; sori elliptic to linear, borne on one side of a veinlet; indusium cup-shaped or elliptic to linear, attached to the veinlet.

1 Fronds simple — 1. *A.* sp. *A*
  Fronds pinnate to quadripinnate — 2
2 Fronds pinnate, pinnae toothed to lobed — 3
  Fronds pinnate-pinnatifid to quadripinnate — 25
3 Terminal segment absent, the rachis elongated and proliferous at the apex — 2. *A. sandersonii*
  Terminal segment present — 4
4 Terminal segment similar to the lateral pinnae — 5
  Terminal segment unlike the lateral pinnae — 8
5 Fronds gemmiferous — 6
  Fronds not gemmiferous — 7
6 Gemma present on the upper (adaxial) side of the costa of the terminal pinna, about half way between the base and apex; pinnae 2–4 pairs — 3. *A. angolense*
  Gemma present at the base of the terminal pinna; pinnae usually 5–10 pairs — 4. *A. gemmiferum*



Athyrium scandicinum (pinnule)
Asplenium erectum
A. friesiorum (pinna)
Diplazium velamino-sum (pinnule)
Dryoathyrium boryanum (pinnule)
A. protensum (pinna)
A. erectum (pinna)
A. lividum (pinna)
Didymochlaena trunculata (pinnules)
A. aethiopicum (pinna)
Phanerophebia caryotidea (pinna)
A. aethiopicum (pinna)
A. abyssinicum (pinna)
Polystichum volkensii (pinnules)
A. linckii (pinna)
Dryopteris kilemensis (pinnule)

7 Plants epiphytic; indusium about 0·5 mm wide; sori usually medial or slightly subcostal 5. *A. ceii*
Plants terrestrial; indusium about 1 mm wide; sori subcostal 4. *A. gemmiferum*

8 Rachis gemmiferous 9
Rachis not gemmiferous (if stipe gemmiferous see *A. monanthes*) 15

9 Rachis hairy; pinnae margins usually deeply toothed or lobed 10
Rachis glabrous (although sometimes paleate); margins crenate to doubly serrate 11

10 Pinnae normally 20–55 pairs, lanceolate to oblong; frond apex gradually acuminate; costae of mature fronds prominent above, not grooved 6. *A. protensum*
Pinnae 8–20 pairs, lanceolate to deltoid; frond apex abruptly acuminate; costae grooved, not prominent above 7. *A. adamsii*

11 Stipes a uniform lustrous brown or reddish brown; pinnae to 1·5 cm long, dimidiate 8. *A. normale*
Stipes green or green on the adaxial surface and black on the abaxial surface, dull; pinnae 1·5–12 cm long 12

12 Sori 2–3·5 mm long; indusium elliptic to oblong-elliptic 13
Sori 3–10 mm long; indusium narrowly oblong to linear 14

13 Margin coarsely and doubly serrate 9. *A. boltonii*
Margin finely serrate 10. *A. elliottii*

14 Pinnae 7–10 pairs, widely spaced, usually without a prominent basal auricle 11. *A. christii*
Pinnae 10–20 pairs, usually close together, with a prominent basal auricle 12. *A. macrophlebium*

15 Pinnae cuneate-lacerate with an abruptly caudate apex; rachis lustrous brown, usually brittle; plants usually epiphytic 13. *A. megalura*
Pinnae variously shaped but not as above; rachis green to lustrous brown or black, seldom brittle; plants usually terrestrial (except *A. friesiorum* and *A.* sp. *B*) 16

16 Rachis hairy 7. *A. adamsii*
Rachis glabrous (sometimes paleate) 17

17 Rhizome long-creeping with spaced fronds 18
Rhizome erect or short-creeping with ± tufted fronds 19

18 Pinnae dimidiate, to 5 cm long, oblong; sori medial; plants terrestrial, usually growing near waterfalls or streams 14. *A. unilaterale*
Pinnae not dimidiate, 5·5–14 cm long, narrowly lanceolate; sori subcostal; plants epiphytic or less commonly terrestrial, not primarily associated with streams or waterfalls 15. *A. friesiorum*

19 Lower pinnae regularly reduced towards the base of the frond, the lowermost ones deltoid 20
Lower pinnae only slightly smaller than the ones above them 23

20 Upper margins of middle pinnae laciniate, cut more than half the width of the pinnae 16. *A. formosum*
Upper margins of middle pinnae crenate to shallowly lobed 21

21 Stipe and rachis lustrous brown; middle pinnae elliptic to oblong; margin crenate; pinnae with basal auricle (when present) not separated from the rest of the pinna by a sinus 22
Stipe and rachis dull, green or brown; middle pinnae mostly lanceolate; margin crenate to lobed; pinnae with basal auricle frequently separated from the rest of the pinna by a sinus 19. *A. erectum*

22 Pinnae dimidiate, with a prominent basal auricle; middle pinnae 0·8–1·6 (–1·9) cm long; sori usually 1–3 (sometimes up to 6) per pinna and confined to the lower half of the pinna; stipes sometimes gemmiferous 17. *A. monanthes*
Pinnae not dimidiate, usually without a basal auricle; middle pinnae 0·3–0·9 cm long; sori (1–) 2–10 per pinna, in approximately equal numbers in both halves of the pinna; stipes never gemmiferous 18. *A. trichomanes*

23 Pinnae acuminate; rhizome and stipes fleshy; croziers and often stipe bases covered with a tangle of hair-like scales; indusium 1–1·5 mm broad 20. *A.* sp. *B*
Pinnae obtuse to acute; rhizome and stipes not fleshy; croziers and stipe bases without hair-like scales; indusium less than 1 mm broad 24

24 Middle pinnae 1·2–1·8 cm long; lower margin of pinna toothed only in the outer quarter to third of its length 21. *A. suppositum*
Middle pinnae 2–5 cm long; lower margin of pinna toothed in the outer half to three-quarters of its length 22. *A. inaequilaterale*

25 Sori one on each segment; segments linear to

narrowly oblong-elliptic (sometimes slightly broadened towards the apex); apex of segment rounded and entire; indusium often reaching the margin, often cup-shaped 26

Sori more than one on each segment (often one on *some* segments of *A. abyssinicum* and *A. linckii*); segments usually cuneate and toothed at the apex (entire in *A. abyssinicum*); indusium not reaching the margin, never cup-shaped 35

26 Fronds dimorphic: stolon-like, gemmiferous fronds of indeterminate growth and lacking a lamina produced in addition to the normal fronds; normal fronds 3–16 cm long; lamina narrowly deltoid, widest at the base 23. *A. mannii*

Fronds uniform, if gemmiferous, then the gemmae borne on the upper part of the rachis; frond length and shape various; lamina widest above the base (sometimes widest at the base in *A. theciferum*) 27

27 Fronds gemmiferous 28

Fronds not gemmiferous 32

28 Pinnae 1·3–3 (–4·5) cm long; bases of pinnae very asymmetric with the basiscopic pinnule opposite the sinus between the second–third to fourth–fifth acroscopic pinnules 24. *A. dregeanum*

Pinnae 3–11 cm long; bases of pinnae more symmetrical; first basiscopic pinnule opposite the sinus between the first–second acroscopic pinnules 29

29 Sori confined to the pinnule and pinna lobes; basal acroscopic pinnules of middle pinnae pinnatifid, forming a winged costule less than or equal to the pinnule lobes in width 30

Sori extending from the lobes into the winged costal or costular part of the lamina (rarely confined to the lobes in some pinnules); basal acroscopic pinnules of middle pinnae lobed to pinnatifid, if forming a winged costule, then this greater than the pinnule lobes in width 31

30 Middle pinnae lanceolate to narrowly deltoid, gradually tapering from the base to an acute or acuminate apex 25. *A. bugoiense*

Middle pinnae oblong to lanceolate-oblong; apex abruptly acute 26. *A.* sp. *C*

31 Basal acroscopic pinnule of middle pinnae much more developed than the basal basiscopic pinnule; basal basiscopic pinnule usually slightly smaller than the next basiscopic pinnule 27. *A. pseudoauriculatum*

Basal acroscopic pinnule of middle pinnae only slightly more developed than the basal basiscopic pinnule; basal basiscopic pinnule equal to or slightly larger than the next basiscopic pinnule 28. *A.* sp. *D*

32 Fronds tri- to quadripinnate; croziers and stipe bases covered with a dense, matted, hair-like indumentum; plants usually epiphytic on tree-fern trunks 29. *A. hypomelas*

Fronds pinnate-pinnatifid to rarely pinnate-bipinnatifid; hair-like indumentum usually absent (sometimes present in *A. loxoscaphoides*); plants terrestrial or epiphytic 33

33 Sori terminal or subterminal on the segments; indusium terminal on a veinlet; pinnae 6–12 pairs; pinnules 2–7 pairs 30. *A. theciferum*

Sori lateral on the segments; indusium lateral on a veinlet; pinnae 12–42 pairs; pinnules 8–25 pairs 34

34 Sori borne in the middle to upper part of the pinnules; pinnae rounded to acute at the apex, with 8–11 pairs of pinnules (in our area); stipe bases and croziers without a matted, hair-like indumentum; plants drying green; plants of dry or riverine forest, 2500–8100 ft 31. *A. rutifolium*

Sori borne in the middle to lower part of the pinnules; pinnae acuminate to acute at the apex, with 14–25 pairs of pinnules; stipe bases and croziers sometimes with a matted, hair-like indumentum; plants usually drying grey or grey-green; plants chiefly of moist forests and the bamboo zone, 6800–12 200 ft 32. *A. loxoscaphoides*

35 Fronds gemmiferous 33. *A. blastophorum*

Fronds not gemmiferous 36

36 Stipes dark brown, bases swollen and green 34. *A. adiantum-nigrum*

Stipes variously coloured, bases neither swollen nor green 37

37 Stipes lustrous, reddish or brown; margins entire; texture membranaceous; fronds bi- to tripinnate 35. *A. abyssinicum*

Stipes green, brown or black; margins toothed; texture firmly herbaceous to coriaceous, rarely membranaceous; fronds pinnate-pinnatifid to tripinnate 38

38 Stipes entirely green; fronds to 15 cm long; texture membranaceous 36. *A. varians*

Stipes entirely brown or black, or, more commonly, green on the adaxial surface and black on the abaxial surface; fronds of various lengths, but usually more than 15

cm long; texture firmly herbaceous to coriaceous 39

39 Fronds tripinnate 40
Fronds pinnate-pinnatifid to bipinnate 41

40 Lamina ovate-lanceolate to deltoid; fronds ± tufted to shortly spaced; plants of montane forests 37. *A. linckii*
Lamina lanceolate to oblong-lanceolate; fronds widely spaced; plants of the bamboo zone 38. *A. praegracile*

41 Rhizome erect; fronds tufted; stipe bases with numerous hair-like scales 39. *A. aethiopicum*
Rhizome short- or long-creeping; fronds shortly to widely spaced; stipe bases with or without hair-like scales 42

42 Fronds pinnate-pinnatifid 43
Fronds bipinnate-pinnatifid 46

43 Pinnae sessile or subsessile, deltoid, usually clearly discolourous; frond narrowly oblong 40. *A. stuhlmannii*
Pinnae distinctly stalked, usually lanceolate, rarely a few deltoid, not at all to only slightly discolourous; fronds lanceolate to oblong 44

44 Croziers and stipes with two kinds of scales, appearing as if a mixture of long hairs and scales 39. *A. aethiopicum*
Croziers and stipes with only one kind of scale 45

45 Rhizome scales brown; stipes 0·25–0·5 times the length of the lamina; plants found below 6700 ft 41. *A. lividum*
Rhizome scales black; stipes 0·6–2 times the length of the lamina; plants found above 9850 ft 42. *A. uhligii*

46 Rhizome scales copper-coloured; moorland plants 43. *A.* sp. *E*
Rhizome scales dark brown to black; plants of various habitats 47

47 Rhizome scales uniformly coloured; scales of the stipe bases uniform, linear-lanceolate, not mixed with hair-like scales; fronds usually widely spaced on the rhizome; moorland plants 48
Rhizome scales black with narrow brown margins; scales of the stipe base dimorphic, the linear-lanceolate ones mixed with few to many (rarely none) hair-like scales; fronds shortly spaced on the rhizome; plants of various habitats, but rarely of moorland 49

48 Rachis with numerous, minute stalked glands; rhizome scales dark brown or black; lumina yellow 44. *A. actiniopteroides*
Rachis without glands; rhizome scales black; lumina colourless 42. *A. uhligii*

49 Fronds lanceolate-ovate to deltoid, conspicuously discolorous; stipe bases with few or no hair-like scales; plants apparently always terrestrial; not recorded above 6700 ft elevation 45. *A. buettneri*
Fronds lanceolate to narrowly oblong, slightly discolorous; stipe bases with numerous hair-like scales; plants terrestrial or epiphytic, recorded up to 12 000 ft 39. *A. aethiopicum*

1. Asplenium *sp.* **A.**

The strap-shaped fronds, about 25 cm long, tufted on a short, fleshy rhizome, readily distinguish this species. It has sometimes been named *A. holstii* Hieron., a species occurring in the Taita and Sagala hills and on Mt. Kasigau, but the rhizome scales are different.

Only a single collection of this plant has been made in Kenya. It was epiphytic along the Yala River in the Kakamega forest, which is of a moist, intermediate type, at 5000 ft. MUM.

Faden 70/39.

2. Asplenium sandersonii *Hook.* (see p. 66)

Rhizome erect with tufted fronds to about 15 cm long and 2·5 cm wide; fronds arching producing new plants where in contact with the substrate.

This is a common, gregarious epiphyte of moist, montane, and intermediate forests. It occasionally grows in moister spots in dry forests, occurring 3600–8000 ft. HC, HT, HM, HA, HK, HN, MUM, KIS, NAR, MAC, KAJ. Also in the Taita hills and on Mts. Kasigau and Marsabit.

Gillett 16540; Faden 69/095.

3. Asplenium angolense *Bak.*

The position of the gemma is constant and is unique among the East African species of *Asplenium.* The fronds reach a length of about 30 cm and the lateral pinnae a length of 5 cm.

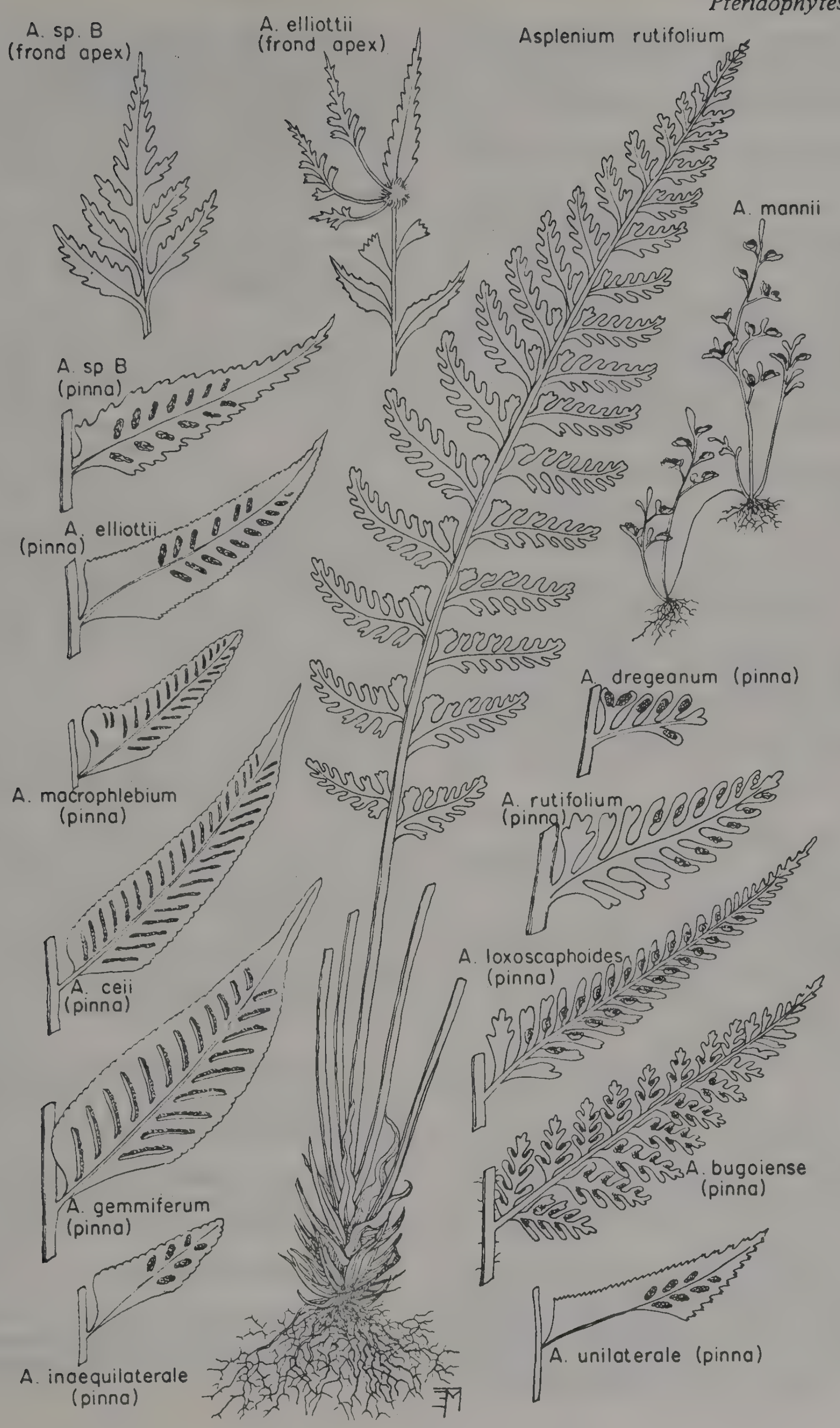
This terrestrial plant grows in dense shade in moist, intermediate forests, 5250–5500 ft. It is known in Kenya only from the Kakamega forest. MUM.

Faden 69/2112, 70/1.

4. Asplenium gemmiferum *Schrad.* (see p. 63)

Rhizome erect; fronds tufted, somewhat fleshy, up to 80 cm long; pinnae up to 12 cm long; sori 1·5 cm long. Some fronds lack gemmae, but it is likely that every plant has at least some gemmiferous fronds.

This is a rather uncommon plant in our area. It is terrestrial in dense shade in moist, intermediate forests, reaching the lower edge of the moist, montane forest in places and occurring


A. sp. B
(frond apex)
A. elliottii
(frond apex)
Asplenium rutifolium
A. mannii
A. sp B
(pinna)
A. elliottii
(pinna)
A. macrophlebium
(pinna)
A. dregeanum (pinna)
A. rutifolium
(pinna)
A. loxoscaphoides
(pinna)
A. ceii
(pinna)
A. gemmiferum
(pinna)
A. bugoiense
(pinna)
A. inaequilaterale
(pinna)
A. unilaterale (pinna)

4900–7500 ft. ?HK, HN, KIS, EMB, KAJ. Also on Mts. Kulal and Marsabit.

Faden and Evans 69/579; Verdcourt 2242.

5. Asplenium ceii *Pic. Ser.* (*A. atroviride* Schelpe) (see p. 63)

The erect rhizome, tufted fronds and large pinnae are all very similar in size and general appearance to *A. gemmiferum*. Fronds of *A. ceii* never have gemmae.

In our area *A. ceii* is always epiphytic, occurring in dense shade in moist, intermediate forests, about 5250–5500 ft. The altitude of the single collection from Mt. Elgon (8000 ft, Gardner 1028) is probably erroneous. ?HE, MUM.

Faden 69/2014; Verdcourt 1671.

6. Asplenium protensum *Schrad.* (see p. 59)

Rhizome erect, bearing narrowly oblong-elliptic, gemmiferous fronds which grow to about 60 cm in length; pinnae deeply lobed with subcostal sori. The freshly cut rhizome has a characteristic odour of oil of wintergreen (methyl salicylate).

This is a common plant of moist, montane and intermediate forests. It may be either terrestrial or a low-level epiphyte and is recorded about 4750–9500 ft. HE, HC, HA, HK, HN, KIT, MUM, KIS, BAR, EMB, MAC, KAJ. Also on Mt. Marsabit and in the Murua Nysigar hills.

Verdcourt and Moggi 2503; Faden and Grumbley 72/342.

7. Asplenium adamsii *Alston*

The small (up to 20 cm long), oblong-elliptic fronds occasionally are gemmiferous and are tufted on an erect rhizome.

This is a plant of moorland and the upper part of the ericaceous zone. It grows on rocky banks near waterfalls, 9750–11 200 ft. HE, HA.

Faden and Evans 69/795; Taylor 3735.

8. Asplenium normale *D. Don*

Fronds narrowly oblong to linear, tufted, up to 30 cm long. Plants closely resemble the much more common *A. monanthes* but can usually be distinguished by the presence of gemmae on the upper part of the rachis in some fronds. In the absence of gemmae, the smaller, more numerous sori per pinna in *A. normale* are sufficient to separate the two species.

This is uncommon in our area. It is terrestrial and grows in dense shade in moist, intermediate, and montane forests from 3250–8000 ft. HA, HK. Locally common in the Taita hills and on Mt. Kasigau.

Faden 71/284; Faden and Holland 72/180.

9. Asplenium boltonii *Schelpe*

Plants of this species can be distinguished from the much more common *A.* sp. *B* only by the presence of gemmae on the fronds. Both have an erect fleshy rhizome and tufted fleshy fronds which can reach a length of about 70 cm. In both the sori are elliptic with a broad indusium.

The sole unambiguous record from our area is from the bamboo zone at 9000 ft. In the Taita hills this plant occurs at about 5300–7000 ft and is terrestrial. HK, ?MAC.

White 1346.

10. Asplenium elliottii *C. H. Wright* (see p. 63)

Rhizomes erect; fronds generally 30–60 cm (occasionally more than 100 cm) long. The basiscopic halves of the middle pinnae bases are less cuneate than in *A. boltonii* and *A.* sp. *B*.

This is a very common, often gregarious, moist montane-forest plant which extends down into moist intermediate forests and up into the bamboo zone. It is consistently terrestrial except in the Kericho area where it occasionally grows as a low-level epiphyte. Recorded 4000–8750 ft. HE, HT, HM, HA, HK, HN, KIT, MUM, KIS, EMB, MAC, KAJ. Also in the Taita hills and on Mt. Kasigau.

Faden 69/087; Fries 1233.

11. Asplenium christii *Hieron.*

Plants of this species resemble small plants of *A. elliottii* in their erect rhizomes, tufted, gemmiferous fronds and general cutting of the lamina. They differ most clearly in their longer (up to 8 mm long), linear sori and narrower (up to 0·8 mm wide) indusium. The fronds of plants in our area appear to be uniform while those of Taita and Sagala hills' plants are dimorphic.

This is an uncommon plant of moist, intermediate forests. It is terrestrial in dense shade, 4750–6250 ft. ?HK, MUM, EMB.

Faden 69/2004; Schelpe 2395.

12. Asplenium macrophlebium *Bak.* (see p. 63)

Rhizome erect; fronds tufted, oblong-lanceolate, gemmiferous up to about 30 cm long; basal auricle never separated from the rest of the pinna by a sinus.

This plant is terrestrial in moist, intermediate forests. It occurs about 5250–6000 ft and is common in the Kakamega forest. MUM. Also in the Taita hills.

Faden 69/1999, 69/2021.

13. Asplenium megalura *Hieron.*

Fronds tufted with an oblong lamina. The wedge-shaped pinnae make this species unmistakable.

This is usually a pendulous epiphyte (rarely terrestrial) in moist, intermediate, and montane forests. Occurs 3000–8000 ft. Common in the Kericho area, but apparently uncommon elsewhere. HT, HM, HN, KIS, KIT. Also in the Taita, Sagala, and Maungu hills and on Mt. Kasigau.

Faden, Evans, and Worth 69/708; Faden and Cameron 72/300.

14. Asplenium unilaterale *Lam.* (see p. 63)

Fronds 20–30 cm long with the lower pinnae only slightly reduced; pinnae often with sori confined to the outer quarter or third.

This species occurs along streams and near waterfalls in riverine and moist, intermediate forests 4400–5500 ft. HA, MUM, EMB, MAC. Also in the Taita hills.

Faden 68/821; Schelpe 2404.

15. Asplenium friesiorum *C. Chr.* (see p. 59)

Fronds 60–100 cm long with narrowly lanceolate pinnae with attenuate apices and coarsely serrate to deeply lobed margins. The arrangement of the sori in two rows very close to the costa is distinctive.

Common in moist, montane forests, particularly *Ocotea* (camphorwood) forests, where it grows high on trees with other ferns such as *Elaphoglossum lastii*, *Drynaria volkensii*, and *Oleandra distenta*. It also grows in the bamboo zone and moist, intermediate forests, occurring at 4600–9000 ft. HM, HA, HK, HN, KIS. Also in the Taita and Sagala hills and on Mt. Kasigau.

Lucas 227; Faden and Grumbley 72/341.

16. Asplenium formosum *Willd.*

Fronds tufted, to 15 cm long and 2·5 cm wide. This species differs from *A. erectum* var. *usambarense* in having generally smaller fronds with more deeply lobed pinnae.

This rare (in our area) fern was found in partially shaded rock crevices at the northern end of the Kakamega forest at 5400 ft. MUM.

Faden 69/2113.

17. Asplenium monanthes *L.* (see p. 66)

Fronds linear, 25–40 cm long; sori are parallel to the basiscopic margins of the oblong pinnae.

A common plant of the bamboo zone, it also occurs in dry, montane forests. It is sometimes found along streams and may grow in dense shade or full sun, 6850–11 200 ft. HE, HC, HT, HM, HA, HK, KIS.

Greenway and Kanuri 13868; Schelpe 2590.

18. Asplenium trichomanes *L.*

Fronds narrowly oblong, up to 15 cm long and 1·8 cm wide; pinnae rounded at apex and less than twice as long as wide.

This uncommon species occurs in moist, shaded rock crevices, 7000–8000 ft. HT, HM, RV. Also in Murua Nysigar hills.

Glover, Gwynne, and Samuel 1720; Faden 70/859.

19. Asplenium erectum *Willd.* (see p. 59)

Fronds generally 25–40 cm long.

This species extends from moist intermediate forests up into the bamboo zone, in dense shade. It can be divided into two varieties: the typical one differing from var. *usambarense* (Hieron.) Schelpe by its acute pinnae, costa often whitish (not dark) above and the sori more than 2 mm from the margin. These occur in the same zone but the typical variety is mainly western in its distribution; 4300–9000 ft. HE, HT, HM, HA, HK, HN, KIT, MUM, KIS, EMB, MAC, NBI, KAJ.

Hedberg 90; Faden and Cameron 72/308; Faden, Evans, and Worth 69/674; Gardner in Batiscombe 966.

20. Asplenium *sp.* **B.** (see p. 63)

For similarities to and distinctions from *A. boltonii*, see that species (above).

Unlike *A. boltonii*, this plant is strictly epiphytic. It occurs in moist, montane forests and in the bamboo zone, about 4900–9800 ft. HT, HM, HA, HK, HN, KIT, KIS, ?EMB.

Faden and Evans 69/895; Verdcourt and Polhill 2988.

21. Asplenium suppositum *Hieron.*

The smaller, more finely toothed and more numerous pinnae give this plant a different 'look' from *A. inaequilaterale*, and I consider them distinct species. Both are terrestrial and were found growing side by side in the Lower Imenti forest near Meru. The narrowly oblong fronds of *A. suppositum* reach to 30 cm.

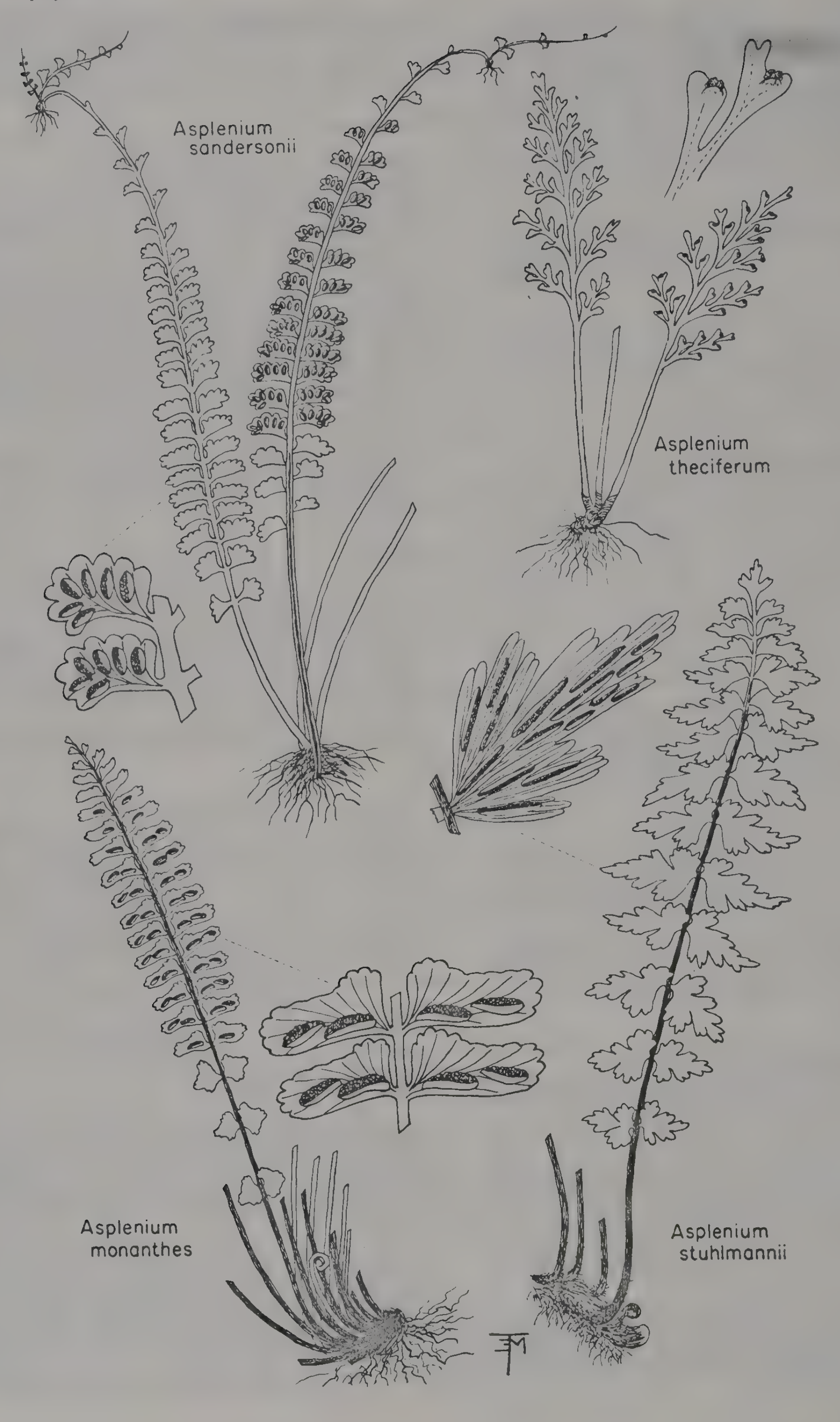
A plant of moist, intermediate forests, occurring along streams at about 4000 ft. It has been collected only twice in Kenya. EMB.

Faden 70/124; Balbo 781.

22. Asplenium inaequilaterale *Willd.* (see p. 63)

Fronds generally 20–30 cm long. For distinctions from *A. suppositum* see above and key. It differs from *A. unilaterale* chiefly in its erect rhizome and tufted fronds.

A species of moist, intermediate forests occurring in dense shade near streams and rivers, but occasionally found far from running water. There are also two collections from dry, intermediate forests and one from moist, montane forest. Recorded about 4000–6500 ft, but rare above



Asplenium sandersonii
Asplenium theciferum
Asplenium monanthes
Asplenium stuhlmannii

5900 ft. MUM, KIS, EMB, NBI. Also in the Taita hills and on Mt. Kasigau.

Faden 69/2005; Agnew 7571.

23. Asplenium mannii *Hook.* (see p. 63)

The pinnae of the normal fronds are alternate as are the gemmae of the gemmiferous fronds, which can reach a length of at least 45 cm.

A gregarious epiphyte of moist, intermediate, and montane forests. Generally uncommon except in the Kericho area; occurring about 5300–8000 ft. HT, HM, HA, HK, MUM, KIS. Also in the Taita hills and on Mt. Kasigau.

Kerfoot 2977; Faden and Holland 72/187.

24. Asplenium dregeanum *Kunze* (see p. 63)

Fronds tufted, generally 25–40 cm long. The numerous, small, crowded pinnae with very unequal-sided bases readily distinguish this species.

This plant is terrestrial in dense shade in moist, intermediate forests. It is known in our area only from the Kakamega forest at 5600 ft. MUM. Also on Mt. Kasigau, 3250–3600 ft.

Faden 69/2018, 69/2103.

25. Asplenium bugoiense *Hieron.* (see p. 63)

The finely-dissected fronds with narrowly triangular middle pinnae are not likely to be confused with any other species except *A.* sp. *C.* Both are recorded from the Aberdares and Mt. Kenya, and some intermediates have been collected, e.g. Faden 69/023. Plants from western Kenya are all *A. bugoiense.*

This plant grows in moist, montane forests in dense shade, usually near streams. It is generally terrestrial and is recorded about 6500–8800 ft. HE, HM, HA, HK, HN, KIT, KIS.

Maas Geesteranus 5659; Faden and Cameron 72/289.

26. Asplenium *sp.* **C.**

In typical plants of this species, the segments are narrower than in *A. bugoiense.* The distal, unlobed pinnules of the middle pinnae are often at an angle of 70–90° to the costa, while those in *A. bugoiense* are usually at an angle of 45–60°.

This is another terrestrial plant of moist montane forests, perhaps extending down into moist, intermediate forests in the Meru area. It occurs in dense shade near streams. HA, HK, EMB.

Gardner 1266; Balbo 776.

27. Asplenium pseudoauriculatum *Schelpe*

This species differs from *A. bugoiense, A.* sp. *C* and *A.* sp. *D* in having the basal acroscopic pinnule much larger than the next acroscopic pinnule and the basal basiscopic pinnule. It differs from *A. dregeanum* in having generally larger fronds (up to about 60 cm long) with larger pinnae having more numerous pinnules and a more symmetrical base. The fronds are tufted.

Known only from moist, intermediate forests, in dense shade; it generally occurs near streams and is recorded at c. 5400 ft. MUM (Kakamega forest and Kaimosi).

Gillett 16703; Faden 69/2117.

28. Asplenium *sp.* **D.**

This species is intermediate in frond cutting between *A. bugoiense* and *A. pseudoauriculatum*, the pinnae being narrowly triangular but less divided than *A. bugoiense.* The fronds are tufted. Since this species has only been collected once, the limits of its variation are uncertain.

Known only from the Kakamega forest, which is of a moist, intermediate type, this terrestrial plant was found growing in dense shade at 5400 ft. MUM.

Faden 69/2019.

29. Asplenium hypomelas *Kuhn*

The large (up to about 100 cm long), finely-dissected fronds with small, cup-shaped indusia are unmistakable.

The association of this species with the tree fern *Cyathea manniana* is, in the author's experience, absolute. The *Asplenium* may be epiphytic on the trunks or may be growing on the ground below the tree ferns, perhaps having fallen off one. The habitat is the same as for the *Cyathea*: moist, montane forests generally along rivers. Occurs about 5000–7500 ft. HA, HK, HN, KIS, ?EMB. Also in the Taita hills.

Kabuye 48; Faden and Grumbley 72/346.

30. Asplenium theciferum *(Kunth) Mett.* (see p. 66)

Fronds tufted, somewhat fleshy, up to about 35 cm long; lamina generally narrowly oblong-elliptic, but in some plants from western Kenya (Tweedie 2970; Faden and Evans 69/2057) ovate-deltoid. The latter are close to *A. cornutum* Alston of West Africa.

This is a very common and widespread fern in Kenya and grows in a variety of habitats. It is epiphytic in moist, intermediate and montane forests and in the bamboo zone, frequently growing on isolated trees or clumps of trees. It occurs about 2900–9500 ft. HE, HC, HT, HM, HA, HK, HN, KIT, MUM, KIS, NAR, MAC, KAJ. Also on forested hills east and north of our area.

Bally 4810; Faden 69/1853.

31. Asplenium rutifolium (*Berg.*) *Kunze* (see p. 63)
Fronds arching, fleshy, tufted on an erect rhizome and generally 30–40 cm long.

Occurring in dry or riverine forests, usually on banks or in rock crevices or occasionally epiphytic in the wettest places. HA, KIS, ?EMB, MAC, NBI, KAJ. Also on the forested hills to the east and north of our area.

Faden 67/510; Opiko 327.

32. Asplenium loxoscaphoides *Bak.* (see p. 63)
Fronds fleshy, tufted on an erect rhizome, either rigidly erect or arching, to 75–120 cm tall. Plants of the Kericho area are smaller (fronds 30–65 cm long) and brighter green than higher altitude plants and may represent a distinct variety.

This is primarily a plant of the bamboo zone, but it extends into moist, montane forests in some areas. It is terrestrial everywhere except in the Kericho area. HE, HC, HM, HA, HK, KIS, KAJ.

Hedberg 116; Faden and Cameron 72/299.

33. Asplenium blastophorum *Hieron.*
Fronds narrowly deltoid, bipinnate and shortly spaced on a short-creeping rhizome. In habit and cutting of the fronds, this species most closely resembles the non-gemmiferous *A. buettneri*, but in that species the pinnae are more dissected.

A terrestrial species in moist, intermediate forests, occurring at c. 5400 ft. MUM (Kakamega and Malava forests).

Faden 69/2040, 69/2114.

34. Asplenium adiantum-nigrum *L.*
Fronds bi- to tripinnate, about 25 cm in length and tufted on a short rhizome. Lamina deltoid and usually coriaceous in our area.

In our area this is primarily a species of the ericaceous zone and moorland, occurring 9800–12 500 ft. Terrestrial, growing in dense shade, frequently near streams. HE, HC, HA, HK. Occurs at much lower altitudes in the Taita and Sagala hills.

Faden and Evans 69/801; Schelpe 2563.

35. Asplenium abyssinicum *Fée* (see p. 59)
Fronds commonly 30–40 cm long and tufted on an erect rhizome; lower pinnae reduced in size; rachis lacking scales and hairs.

This is primarily a plant of the bamboo zone and occurs in dense shade along streams. It extends up into the moorland and down into moist, montane forest, occurring about 6000–11 500 ft. HE, HT, HA, HK, HN.

Faden 69/109; Verdcourt 2048.

36. Asplenium varians *Hook. & Grev.*
Fronds delicate, tufted on an erect rhizome with a narrowly elliptic bipinnate lamina.

This uncommon fern grows in rock crevices in dry forests, about 5000–5600 ft. ?HE, KIS, BAR, RV, NBI.

Faden and Evans 69/2080; Mabberley and McCall 104.

37. Asplenium linckii *Kuhn* (see p. 59)
Rhizome creeping with shortly spaced fronds generally 30–50 cm long; lamina finely dissected bearing small, wedge-shaped segments to 3 mm wide, with marginal teeth 1–2 mm long.

This very attractive fern is a species of moist, montane forests. It is usually terrestrial (occasionally growing on the bases of trees) and grows in dense shade, about 5650–8200 ft. HT, HA, HK, HN, ?EMB. Also in the Taita hills.

Polhill, Verdcourt, and Lucas 323; Faden 69/003.

38. Asplenium praegracile *Rosenst.*
The sole Kenya collection looks like a large, deeply-cut plant of *A. aethiopicum* but differs most clearly in its long-creeping rhizome with widely spaced fronds. The correct name for this species is uncertain.

This plant was found in the bamboo zone in dense shade near a stream at 9600 ft. HA.

Faden 71/880.

39. Asplenium aethiopicum (*Burm. f.*) *Becherer* (see p. 59)
As broadly interpreted here, this species is very variable. Rhizome erect with tufted fronds or short-creeping with shortly spaced fronds; fronds generally 30–60 cm long; pinnae deltoid to narrowly lanceolate and pinnatifid to pinnate-pinnatifid. The presence of two types of scales on the stipe bases and croziers is characteristic.

This is the most common and widespread species of *Asplenium* in Kenya. It occurs in dry and moist forests, moist bushland, and extends up into the moorland, occurring 4700–11 800 ft. It can be terrestrial or epiphytic. HE, HC, HT, HM, HA, HK, HN, KIT, MUM, KIS, NAR, RV, NAN, NBI, MAC, KAJ. Also on forested hills to the east and north of our area.

Greenway and Kanuri 13866; Faden and Grumbley 72/348.

40. Asplenium stuhlmannii *Hieron.* (see p. 66)
Fronds shortly spaced on long-creeping rhizomes, generally 30–45 cm long and rigidly erect and coriaceous; middle and lower pinnae strictly opposite.

This plant grows in somewhat sheltered rock crevices generally in grassland, less commonly at the edges of riverine forests. It grows in partial shade or full sun, about 3000–7300 ft. HC, HT, KIT, MUM, MAC. Also in the Taita hills.

Greenway 8538; Faden 70/127.

41. Asplenium lividum *Kuhn* (see p. 59)

Fronds of this species resemble narrow, pinnate-pinnatifid fronds of *A. aethiopicum* in size and shape of the lamina, but differ in having lanceolate pinnae which are very asymmetric at the base. Fronds to about 30 cm long, with the lobes of the pinnae subequal except for a much enlarged and often oblong basal acroscopic lobe.

This local and uncommon plant occurs in riverine and moist intermediate forests, about 4800–5400 ft. It grows in dense shade, either on rocks or trees. KIS, MUM, MAC, NBI, KAJ.

Gillett 16698; Faden 68/834.

42. Asplenium uhligii *Hieron.*

This species along with *A. actiniopteroides*, *A.* sp. *E* and *A. kassneri* Hieron. (the last not definitely recorded from Kenya) form a group of closely related species which occur primarily in the moorland, extending down in the *Hagenia–Hypericum* zone. They are either terrestrial or epiphytic. All of these species have thin, long-creeping rhizomes with widely spaced fronds which generally have long stipes. *A. uhligii* is recognized by its black rhizome scales with entire margins and colourless lumina.

Since the species limits in this group are still uncertain, the distributions given here are subject to revision. HK.

Meinertzhagen in AH 9477; Furnari s.n.

43. Asplenium *sp.* **E.**

The copper-coloured scales readily distinguish this plant. It is the common species of this group on Mt. Kenya (see notes under *A. uhligii*). HE, HA, HK.

Hedberg 1833; Agnew, Hedberg, and Mmari 9625.

44. Asplenium actiniopteroides *Peter*

The lamina is usually ovate-deltoid and more finely dissected than the other species in this group (see *A. uhligii*). The dark scales and glandular rachis are the best characters for recognizing this species. HE, HK.

Hedberg 954; Schelpe 2848.

45. Asplenium buettneri *Hieron.*

Fronds shortly spaced on a short-creeping rhizome and generally 25–40 cm long. Best distinguished from *A. aethiopicum* by the shape of the lamina, and from *A. blastophorum* by the lamina being more finely dissected and lacking gemmae on the rachis.

A characteristic plant of dry and riverine forests at medium altitudes, also occurring in moist, intermediate forests. It is terrestrial and grows in dense shade from sea level to about 5500 ft. HA, MUM, KIS, MAC, NBI. Also in the Taita hills and along the coast.

Faden 68/813; Napper 490.

53. CETERACH *Garsault*

Small terrestrial plants; rhizome erect, densely covered with clathrate scales; stipes very short, with two vascular strands at the base uniting to form an X-shape above; lamina pinnatifid to rarely tripinnatifid, densely covered on the lower surface with light brown, clathrate scales; venation free (in our plant); sori elongate along one side of a veinlet; indusium absent.

Ceterach cordatum (*Thunb.*) *Desv.*

Fronds tufted to 15 cm long, with rounded frond and pinnae apices; fronds curling when dry.

Plants are usually found in partially shaded rock crevices in bushland or woodland, 5000–6000 ft. HA, NAR, BAR, RV, NAN, MAC, NBI. Also at Maralal.

Mabberley and McCall 89; Glover, Gwynne, and Paulo 493.

54. PLATYCERIUM *Desv.*

Medium to large, epiphytic or rarely terrestrial herbs; rhizome short and concealed by the fronds, covered with non-clathrate scales; fronds simple, dimorphic; sterile (nest) fronds sessile and cordate-clasping the rhizome, lobed or unlobed, appressed to the substrate; fertile fronds stipitate, obovate, unlobed (in our plant) or dichotomously forked; fronds densely stellate pubescent; venation reticulate with included veinlets; sori completely covering specialized areas on the fertile fronds; indusium absent.

Platycerium angolense *Bak.*

A large epiphyte with elephant-ear-shaped nest fronds; fertile fronds with a single large area of sporangia near the apex.

Usually grows on trees in forests, at forest edges or in the open. The single record for this area must be considered somewhat doubtful. KIT. Also occurs occasionally along the coast.

Jack 563.

55. PYRROSIA *Mirb.*

Small terrestrial or epiphytic herbs; rhizome thin, long-creeping, densely covered with non-clathrate

scales; fronds widely spaced; stipes articulated to the rhizome; lamina simple, unlobed, lanceolate to oblanceolate (in our plant), densely covered on the lower surface with stellate scales; margin entire; venation reticulate with included veinlets; sori round, separate or more or less confluent in the distal part of the frond; indusium absent.

Pyrrosia schimperana (*Mett.*) *Alston*

Fronds pendent, flaccid, whitish-brown beneath.

A locally common plant of riverine and moist, intermediate forests, occurring 2000–6400 ft. It grows on rocks and trees. MUM, KIS, NAR, MAC. Also on Ol Doinyo Sabachi (Lolokwi).

Lucas 92; Glover, Gwynne, and Samuel 47.

56. DRYNARIA (*Bory*) *J. Sm.*

Large epiphytic herbs; rhizome long-creeping, thick, densely covered with ciliate scales; fronds widely spaced, glabrous, dimorphic; sterile fronds sessile, pinnately lobed, without chlorophyll; fertile fronds stipitate, the stipe articulated to the rhizome, lamina pinnatifid, the pinnae broadly attached and articulated to the rachis; venation reticulate with included veinlets; sori round, in two subcostal rows on each pinna of the fertile frond; indusium absent.

Drynaria volkensii *Hieron.*

Fertile fronds to 1 m; sterile, bracket-like fronds much smaller, retaining falling debris; rhizome scales dark brown.

A locally common species of moist, montane forests, particularly *Ocotea* (camphorwood) forests, commonly associated with other epiphytic ferns such as *Elaphoglossum lastii, Oleandra distenta* and *Asplenium friesiorum.* It occasionally persists on isolated trees in cultivated, formerly forested areas. Occurs 5250–7500 ft. HM, HA, HK, MUM, KIS.

Bally 4871; Faden 69/1861.

57 LOXOGRAMME (*Blume*) *C. Presl*

Small epiphytic or terrestrial herbs; rhizome thin, long-creeping, densely covered with clathrate scales; fronds widely spaced, stipitate; lamina simple, unlobed, oblanceolate, glabrous, tapered at both ends; margin entire; venation reticulate with included veinlets; sori elongate, oblique to the midvein and arranged in two rows near it; indusium absent.

Loxogramme lanceolata (*Swartz*) *C. Presl*

The fronds are slightly fleshy, and the lateral veins are inconspicuous.

One of the most common ferns in Kenya, occurring in dry and wet forests, about 3000–8200 ft; it is usually epiphytic but occasionally grows on rocks. HE, HC, HT, HM, HA, HK, HN, KIT, MUM, KIS, MAC, KAJ. Also in the Taita and Sagala hills and on Mts. Kasigau and Marsabit.

Verdcourt 1672; Faden, Evans, and Worth 69/664.

58. PHYMATODES *C. Presl*

Medium-sized, epiphytic or terrestrial herbs; rhizome long-creeping, fleshy, nearly naked except near the apex where covered with peltately-attached, lanceolate, clathrate scales with ciliolate margins; fronds widely spaced, glabrous, fleshy, simple (in young plants) to deeply pinnatifid with 3–8 pairs of opposite segments; stipes articulated to the rhizome; lamina ovate; margin entire to slightly sinuate; venation reticulate with included veinlets; sori round to elliptic, somewhat sunken in the lamina, in 4(–2) rows in each of the segments; indusium absent.

Phymatodes scolopendria (*Burm. f.*) *Ching*

Fronds to about 80 cm in length, slightly less than half of which is the stipe.

A terrestrial or epiphytic species of forests and thickets, it has been collected only once in our area. MUM (Samia hills, hill behind Nangina mission, altitude 4750 ft). Also in the Maungu hills, on Mt. Kasigau, and along the coast.

Dekker in EAH 14728.

59. PLEOPELTIS *Willd.*

Small epiphytic herbs; rhizome long-creeping, thin or thick, densely to sparsely covered with clathrate, peltate scales; fronds widely spaced; stipes articulated to the rhizome; lamina simple, lanceolate to narrowly elliptic or linear, with or without peltate scales on the lower surface, margin entire (rarely slightly sinuate or pinnately-lobed); venation reticulate with included veinlets; sori round to slightly elliptic, borne in two rows parallel to the midvein; indusium absent.

1 Mature fronds with numerous peltate scales on the lower surface; rhizomes thin — 1. *P. macrocarpa*
  Mature fronds without peltate scales on the lower surface; rhizomes thin or thick — 2
2 Rhizome thin; rhizome scales 2–3 mm long, black with paler margins — 2. *P. schraderi*
  Rhizome thick; rhizome scales 2·5–7·5 mm long, brown and uniformly coloured or somewhat darker towards the centre — 3
3 Apex of frond rounded — 3. *P. rotunda*
  Apex of frond acute — 4. *P. excavata*

1. Pleopeltis macrocarpa (*Willd.*) *Kaulf.*

Rhizomes densely covered with small (about 3 mm long) scales having a central dark area and broad, pale, lacerate margins; fronds narrowly lanceolate-elliptic, generally 10–20 cm long. A form with pinnately lobed fronds occurs around Nairobi, growing with the normal type.

This is one of the most common and widespread ferns in Kenya. It occurs in dry or moist forests, riverine forests, the bamboo zone, and occasionally in the moorland. It is usually epiphytic, though sometimes found on rocks, and is recorded about 3000–11 800 ft. HE, HC, HT, HM, HL, HA, HK, HN, KIT, MUM, KIS, NAR, NAN, MAC, NBI, KAJ. Also on forested hills east and north of our area.

Lucas 91; Verdcourt 2430; Isaac 3004; B.Sc. students s.n.

2. Pleopeltis schraderi (*Mett.*) *Tard.*

This species resembles *P. macrocarpa* in its frond shape and thin rhizome. It can be distinguished from that species in having much darker rhizome scales and in lacking peltate scales on the lower surface of the fronds.

This is an uncommon epiphyte in moist, intermediate and montane forests, occurring about 5500–7650 ft. HT, HA, MUM. Also occurs in the Taita hills.

Agnew, Hanid *et al.* 7467; Faden 69/1987.

3. Pleopeltis rotunda (*Bonap.*) *Tard.* (see p. 26)

Like all members of the *P. excavata* complex, this species has a thick rhizome which is glaucous in places where the scales have fallen off. The manifestly rounded apex of the linear-oblanceolate fronds and the large, pale rhizome scales seem sufficiently distinct to maintain this as a species.

This epiphyte occurs primarily in the ericaceous and *Hagenia–Hypericum* zones but extends down into the moist montane forest. It is recorded about 6250–10 000 ft. HC, HA, HK, HN.

Faden 70/98; Mearns 1771.

4. Pleopeltis excavata (*Willd.*) *Sledge*

This species includes all plants with thick rhizomes which do not fit into *P. rotunda.* It is polymorphic but cannot be further divided satisfactorily at this stage of our knowledge. Additional collections are greatly needed.

An epiphyte of moist, intermediate, and montane forests. HE, HC, HM, HA, KIT, KIS, KAJ. Also in the Taita and Sagala hills and on Mt. Kasigau.

Mabberley and McCall 25; Agnew and Musumba 7432.

60. MICROSORIUM *Link*

Medium-sized epiphytic or, less commonly, terrestrial herbs; rhizome thick, short-creeping, covered with black, caducous, clathrate scales; fronds ± tufted, sessile (the base sometimes considered to be a winged stipe); lamina simple (in our plant), glabrous; margin entire; venation reticulate with included veinlets; sori small, round, superficial, very numerous and scattered, occurring at the junctions of veinlets; indusium absent.

Microsorium punctatum (*L.*) *Copel.*

Fronds large, leathery, strap-shaped, tapered at both ends reaching 100 cm in length.

A species of moist thickets (in our area) where it is terrestrial. KIT, KIS. Also occurs as an epiphyte in coastal forests.

Faden 69/1612; Serbai in Faden 69/1718.

61. GRAMMITIS *Swartz*

Small epiphytic herbs; rhizome erect (in our plant), short- or, rarely, long-creeping, densely covered with non-clathrate scales; fronds tufted or shortly to widely spaced; stipes not articulated to the rhizome (in our plant); lamina simple, linear to lanceolate or oblanceolate; margins entire (in our plant) to crenate or rarely somewhat lobed; venation free (in our plant); sori round to elliptic, in a single row on each side of the midvein; indusium absent.

Grammitis *sp.* **A.**

A minute species with tufted, linear-oblanceolate fronds to 6 cm long and 0·4 cm wide. The persistently hairy fronds distinguish this species from the only other Kenya species, *G. nanodes* (Peter) Ching, of the Taita hills and Mt. Kasigau.

A middle- and possibly high-level epiphyte in *Ocotea* (camphorwood) forests; known from a single collection at 7000 ft. HA.

Faden 71/280.

62. XIPHOPTERIS *Kaulf.*

Small epiphytic or, less commonly, terrestrial herbs; rhizome erect to long-creeping, densely covered with scales; fronds tufted or widely spaced; stipes not articulated; lamina simple, linear to narrowly oblong or lanceolate, shallowly lobed to pinnatifid, glabrous or hairy; venation free, usually obscure (in our species); sori round, separate or ± confluent in the upper part of the frond; indusium absent.

1 Rhizome long-creeping; fronds widely spaced, coriaceous, pinnatifid, 5–20 mm wide; upper part of the frond not conspicuously less deeply lobed than the lower part
1. *X. flabelliformis*

Rhizome erect; fronds tufted, herbaceous, 1·5–5 mm wide, pinnatifid in the lower part, serrate to entire towards the apex (of fertile fronds) 2

2 Lobes of sterile part of frond oblong, to 2 mm long; fertile part of frond serrate 2. *X. strangeana*

Lobes of sterile part of frond ovate-deltoid, to 1 mm long; fertile part of frond crenate to entire 3. *X.* sp. *B*

1. Xiphopteris flabelliformis (*Poir.*) *Schelpe*

Rhizome scales lustrous grey-brown; lamina glabrous with several sori per lobe.

This plant occurs primarily in the ericaceous and *Hagenia–Hypericum* zones but extends into the moorland and occasionally into the bamboo zone. Usually epiphytic except in the moorland and is recorded 7300–11 500 ft (most commonly above 9300 ft). HC, HM, HA, HK.

Faden *et al.* 69/518; Verdcourt 2019.

2. Xiphopteris strangeana *Pic. Ser.*

A minute species with fronds to about 6 cm long. It is the species which is usually called *X. myosuroides* (Swartz) Kaulf. in African floras, but the African plants are not conspecific with American plants of that species.

An epiphyte in moist, montane and intermediate forests. Grows high up on tall, forest trees, so it is perhaps much more common than the few collections would suggest; occurs 4900–7000 ft. HA, KIS. Also occurs in the Taita hills and on Mt. Kasigau.

Strange 220; Faden 71/729.

3. Xiphopteris *sp.* **B.**

Plants of this species are similar in size and general appearance to the last. The lobing of the lamina must be studied carefully in order to distinguish the two species (see key).

This species is epiphytic and is known only from the rim of volcanic cone Kirui, north-east Mt. Kenya, at about 8350 ft. It was growing in the ericaceous zone and was very uncommon. HK.

Faden *et al.* 69/524; Faden 70/97.

63. ANTROPHYUM *Kaulf.*

Small or medium, epiphytic or lithophytic herbs; rhizome fleshy, short-creeping, densely covered with dark brown, clathrate scales; fronds shortly spaced, somewhat fleshy (in our plant), glabrous; stipes long (in our plant) with two vascular strands, not articulated; lamina simple, ovate (in our plant), without a midvein; venation prominently anastomosing, without included veinlets; sori elongate along the veins and usually anastomosing with them; indusium absent.

Antrophyum mannianum *Hook.*

Fronds up to 45 cm in length of which more than half is the stipe; frond apex acuminate.

This species grows on rocks and tree trunks in dense shade near streams. It occurs in moist, intermediate forests. MUM (Kakamega forest).

Faden 69/2027; Reichstein *et al.* 3006A.

64. VITTARIA *Sm.*

Small to medium, epiphytic herbs; rhizome short- to long-creeping, densely covered with clathrate scales; fronds shortly spaced; stipes absent or short; lamina simple, linear to linear-lanceolate, unlobed, pendent, glabrous; venation reticulate, consisting of the midvein, two submarginal veins parallel to the midvein and a single row of very elongate areoles (usually obscure), without included veinlets, between the midvein and each of the submarginal veins; sori two, elongate along each of the submarginal veins; indusium absent.

Vittaria volkensii *Hieron.*

Fronds characteristically very narrow, linear (2–4·5 mm wide) reaching 50 cm or more long; stipes black; rhizome scales lustrous, ending in long, hair-like points.

This is a species of moist, montane forests, occurring from 5650–7350 ft. HT, HM, HA, HK, HN, KIT, KIS. Also occurs in the Taita hills.

Faden, Evans, and Worth 69/711; Agnew *et al.* 7443.

65. MARSILEA *L.*

Small or medium, aquatic herbs; rhizome short- to long-creeping, sparsely to densely hairy, much branched; fronds shortly to widely spaced; stipe long in comparison to the lamina, usually sparsely hairy; lamina consisting of two subequal pairs of obdeltoid to obovate pinnae, the four of them clustered at the summit of the stipe and arranged in the form of a cross; pinnae sparsely hairy; margins entire to crenate or lobed; venation reticulate; sporangia borne inside seed-like, pedicellate, brown or black sporocarps which are attached singly (in our area) or in clusters to the rhizome or stipe; sporocarps containing sporangia and spores of two kinds: megasporangia which contain megaspores and microsporangia which contain microspores.

Because of the vegetative similarity of all species, sporocarps are essential for their identification. These are produced only by plants which have become stranded following a drop in the water level. Sporocarps are capable of enduring long periods of drought, and consequently some species of *Marsilea* are able to grow in areas of very low rainfall.

1 Sporocarps attached in a single row to the basal part of the stipe 1. *M. minuta*
Sporocarps attached singly to the base of the stipe or attached to the rhizome 2
2 Pedicels of mature sporocarps hairy; sporocarps brown, 5·5–7·5 mm long 3
Pedicels of mature sporocarps glabrous or nearly so; sporocarps black or dark brown, 3·5–5 mm long 4
3 Sporocarps with spreading hairs (sometimes mixed with appressed hairs) which curl when dry, giving the sporocarp a farinose appearance; upper tooth of sporocarp prominent (in our area) 2. *M. farinosa*
Sporocarps with appressed hairs only; upper tooth of sporocarp not prominent 3. *M. macrocarpa*
4 Pedicels 3–7 mm long, growing upright to ascending 1. *M. minuta*
Pedicels 8–15 mm long, usually growing horizontally or downwards and burying the sporocarp in the mud 4. *M. gibba*

1. Marsilea minuta *L.*

Pinnae of terrestrial plants usually with crenate margins; sporocarps appressed pubescent when young but ± glabrous when mature; pedicel attached to the sporocarp at ± right angles to the long axis of the sporocarp.

This species, the most widespread *Marsilea* in Kenya, grows in small, seasonal streams, seasonal water holes and at the edges of dams. MAC. Also at Isiolo, in the Tsavo area and along the coast.

Faden and Evans 69/934; Perkins in EAH 11052.

2. Marsilea farinosa *Launert*

This species is very close to *M. macrocarpa*, and the difference in the hairs on the sporocarps is the only safe way to separate the two. Fresh sporocarps of *M. farinosa* look fuzzy.

This plant has been found growing in a seasonal water hole and in a seasonal stream, both in the Lukenya–Doinyo Sapuk area. MAC.

Greenway and Napper 13597; Faden, Evans, and Msafiri 70/902.

3. Marsilea macrocarpa *Presl*

This is the largest and most pubescent species in our area: pinnae of terrestrial plants usually lobed at the apex; sporocarps persistently appressed pubescent.

This is the most common species of *Marsilea* in the Nairobi area, and the only one recorded in Nairobi district. It grows in roadside ditches, seasonal pools, and streams and at the edges of permanent streams and rivers. MAC, NBI, KAJ.

Gillett 17331; Faden 72/78.

4. Marsilea gibba *A. Br.*

Vegetatively this species is very similar to *M. minuta.* Sporocarps ellipsoid to suborbicular in lateral view and elliptic in dorsiventral sections; pedicel attached to the sporocarp ± parallel to the long axis of the sporocarp.

This plant occurs in seasonal pools and streams and in roadside ditches. KIS, NAR, RV, NAN, MAC.

Faden and Evans 69/541; Glover *et al.* 1819.

66. SALVINIA *Adans.*

Small, floating, aquatic herbs; rhizome horizontal, branched; roots absent; leaves simple, petiolate, arranged in whorls of three, the upper two normal and floating, the lower one dissected into root-like segments and submersed; lower surface (and often the upper) of floating leaves densely hairy; sporocarps borne on the submersed leaves, each enclosing a basal columnar receptacle to which the sporangia are attached; sporangia and spores of two kinds, megasporangia which contain megaspores and microsporangia which contain microspores.

Salvinia auriculata *Aubl.*

Floating leaves ovate to oblong, 1–2·5 cm long and densely hairy on both surfaces. The correct name of this plant is still in doubt.

This is an introduced plant from tropical America which has become an important weed in Lake Naivasha. KIT, RV, ?NBI.

Bogdan 5316; Barnley in EA H170/57.

67. AZOLLA *Lam.*

Small, floating aquatic herbs; rhizome horizontal, pinnately branched, covered with small imbricate leaves; roots present; leaves alternate, in 2 rows, each leaf bilobed, the upper lobe green and photosynthetic, normally resting on the water, the lower lobe submersed and colourless, usually inhabited by blue-green algae; sporocarps borne on the submersed leaf lobes, dimorphic, the larger containing microsporangia and microspores, the smaller containing megasporangia each containing a single megaspore.

1 Plants to 15 cm long (often much smaller); leaves with broad whitish margins, and never tinged with red 1. *A. nilotica*

Plants to 3 cm long; leaves with narrow whitish margins, or margins not whitish; leaves sometimes tinged with red
2. *A. pinnata*

1. **Azolla nilotica** *Decne.*

Large plants of this species often have branches which are held up above the surface of the water. The rhizome is up to 2 mm thick.

This species occurs on lakes and ponds and in slow flowing streams. KIS, ?NAR, BAR, KAJ. Also in scattered localities to the east of our area.

Leippert 5243; Kenya Exploration Society 53.

2. **Azolla pinnata** *R. Br.*

The plants are generally deltoid, and branches are never held above the surface of the water.

This species grows on stagnant water including rice paddies. HT, KIS, MUM, KAJ.

Verdcourt 3109; Kokwaro 2538.

FLOWERING PLANTS

1. LAURACEAE†

Trees or shrubs, very rarely (as ours) twining parasites, with aromatic glands and alternate simple exstipulate leaves; flowers small, not brightly coloured, often in panicles, bisexual or unisexual, regular; sepals 6, in two whorls, perigynous; petals 0; stamens usually 12, in 4 whorls of 3, the inner 1–2 whorls often sterile, with valvate dehiscence, the two outer whorls dehiscing inwards, the inner whorls usually dehiscing outwards; ovary superior, usually surrounded by the receptacular tube, with one loculus and one ovule; fruit a berry, drupe, or achene.

1. CASSYTHA *L.*

Yellowish parasitic twiners with reduced leaves; inflorescence racemose; flowers bisexual, with an ovoid receptacular tube which enlarges to enclose the fruit; sepals as in the family; stamens as in the family, the third whorl dehiscing outwards, the innermost whorl of staminodes; fruit enclosed in the succulent receptacle.

Cassytha filiformis *L.*
Parasitic herb with yellowish-green trailing stems with haustoria and young stems covered with reddish tomentum; flowers cream; fruit black.

A common coastal plant, parasitic on shrubs and herbs, which occurs in our area only in the drier south. It can easily be mistaken for a *Cuscuta*. MAC, KAJ.

Napper 1620.

2. HERNANDIACEAE‡

Trees or shrubs, very rarely woody climbers, with alternate simple or digitately compound exstipulate leaves; flowers bisexual, or monoecious, or polygamous by abortion, regular, in axillary corymbose or paniculate cymes, with or without bracts; calyx with 3–5 sepals in two whorls or sometimes 4–8 in one whorl; stamens 3–5 in a single whorl, often 4; staminodes glandular, in one or two whorls outside the stamens, or absent; ovary inferior, 1-celled; ovule single. Fruit dry, somewhat ribbed, with 2–4 wings, or wingless but enclosed in the inflated receptacle; seed non-endospermous, with large cotyledons.

† By A. D. Q. Agnew.
‡ By M. A. Hanid.

1. ILLIGERA *Blume*

Illigera pentaphylla *Welw.*
Shrubby climber with mostly 5-foliate leaves, leaflets ovate-elliptic; flowers greenish-white in axillary, paniculate cymes; fruit spheroidal, 2-winged.

A strong forest liane growing at roadsides and forest edges over bushes, recorded only from Kakamega forest. Sheds its winged fruits copiously. MUM.

Lucas 136.

3. RANUNCULACEAE§

Mainly herbs, some climbers and occasional shrubs; leaves opposite or alternate with sheathing base, exstipulate, often compound, often palmate, inflorescence various, flowers regular or zygomorphic; sepals free; petals present or absent, free, sometimes bearing a nectary; stamens indefinite or variable in number; ovary superior of 1–many free carpels, each 1–many-seeded; fruits mostly dry achenes or follicles, rarely fleshy; seeds without arils, with endosperm.

1	Leaves opposite	2
	Leaves alternate or in a rosette	3
2	Climbers or trailing shrubs	1. *Clematis*
	Erect herbs or subshrubs	2. *Clematopsis scabiosifolia*
3	Flowers zygomorphic	6. *Delphinium*
	Flowers regular	4
4	Carpels more than 5	5
	Carpels less than 5	3. *Thalictrum rhynchocarpum*
5	Pedicels with a ring of 3 reduced leaves some distance below the solitary flowers; sepals pinkish outside; petals absent	4. *Anemone thomsonii*
	Pedicels with no ring of reduced leaves; flowers often numerous; sepals green or yellow; petals present, yellow or white	5. *Ranunculus*

1. CLEMATIS *L.*

Climbers, weakly shrubby or herbaceous, with opposite pinnate leaves, whose petiole and rachis twines round the support; flowers regular, in a paniculate inflorescence; sepals 4, petaloid; petals

§ By A. D. Q. Agnew.

and nectaries absent; stamens numerous, sometimes grading into staminodes on the outside; carpels numerous, indefinite, each with one fertile ovule, the style elongating into a plumose or naked awn in fruit.

1 Leaflets suborbicular to ovate, irregularly dentate, some or all leaflets lobed — 1. *C. hirsuta*
  Leaflets ovate to ovate-lanceolate, entire or regularly dentate, lower leaflets not lobed, upper leaflets sometimes with 1–2 lobes — 2. *C. simensis*

1. Clematis hirsuta *Guill. & Perr.* (*C. brachiata* Thunb. in Check List) (see p. 77)

Climber bearing leaves with 5–7 suborbicular to ovate leaflets; inflorescence paniculate; sepals cream or white.

An extremely variable species common in forest edges and in wooded grassland. HE, HC, HM, HA, KIT, MUM, KIS, NAR, RV, NAN, MAC, NBI, KAJ.

Hanid 274; Greenway 7851.

2. Clematis simensis *Fres.* (see p. 77)

Shrubby climber bearing leaves with up to 5 leaflets, often reduced in the paniculate inflorescence; sepals cream or white.

A variable plant common in forest edges and at roadsides in upland rain-forest, often behaving as a strong liane. Its leaves tend to be dark shiny green which distinguishes it immediately from *C. hirsuta.* HE, HC, HT, HA, HK, KIT, MUM, KIS, NAR, MAC, KAJ.

Tweedie 66/330; Hedberg 2000.

2. CLEMATOPSIS *Hutch.*

Similar to *Clematis* except that these are erect perennial herbs, with no twining leaf petiole or rachis, and have more often simple leaves and usually solitary flowers.

Clematopsis scabiosifolia (*DC.*) *Hutch.* (see p. 79)

Perennial herb with simple or trifoliolate leaves; flowers solitary or in few-flowered inflorescences; sepals white, cream, mauve, or pink.

A variable plant of burnt grassland principally in the west of Kenya, often on stony soil. HC, KIT, MUM, KIS.

Hanid and Kiniaruh 830; Thorold 3211.

3. THALICTRUM *L.*

Herbs with compound, alternate leaves, the basal sheath sometimes bearing a stipule-like structure; flowers small, in paniculate inflorescences; sepals 3–5, green or petaloid, caducous; petals and nectaries absent; stamens few to many, indefinite, carpels 1 to many, with one ovule; fruit an achene.

Thalictrum rhynchocarpum *Dillon & A. Rich.*

Glabrous perennial herb bearing much divided leaves with orbicular segments; inflorescences diffuse, with nodding, green flowers; carpels usually solitary; pedicels elongating in fruit.

A soft, often glaucous-looking plant common in forest edges and pathsides in upland rain forest, the leaves looking very like those of the fern *Adiantum thalictroides.* HE, HC, HM, HA, MUM, NAR, KAJ.

Agnew and Harris 5051; Verdcourt 2041.

4. ANEMONE *L.*

Perennial herbs with divided leaves; pedicel with a ring of 3 reduced leaves below the flower; flowers regular, in ours solitary; sepals variable in number, petaloid; petals absent; stamens numerous, sometimes grading into staminodes on the outside; carpels numerous, indefinite, with one ovule each; fruit with a persistent, plumose or naked style, on an elongated receptacle.

Anemone thomsonii *Oliv.*

Rhizomatous silky-tomentose perennial with much-dissected leaves, the ultimate segments oblong-dentate; sepals white or pale pink.

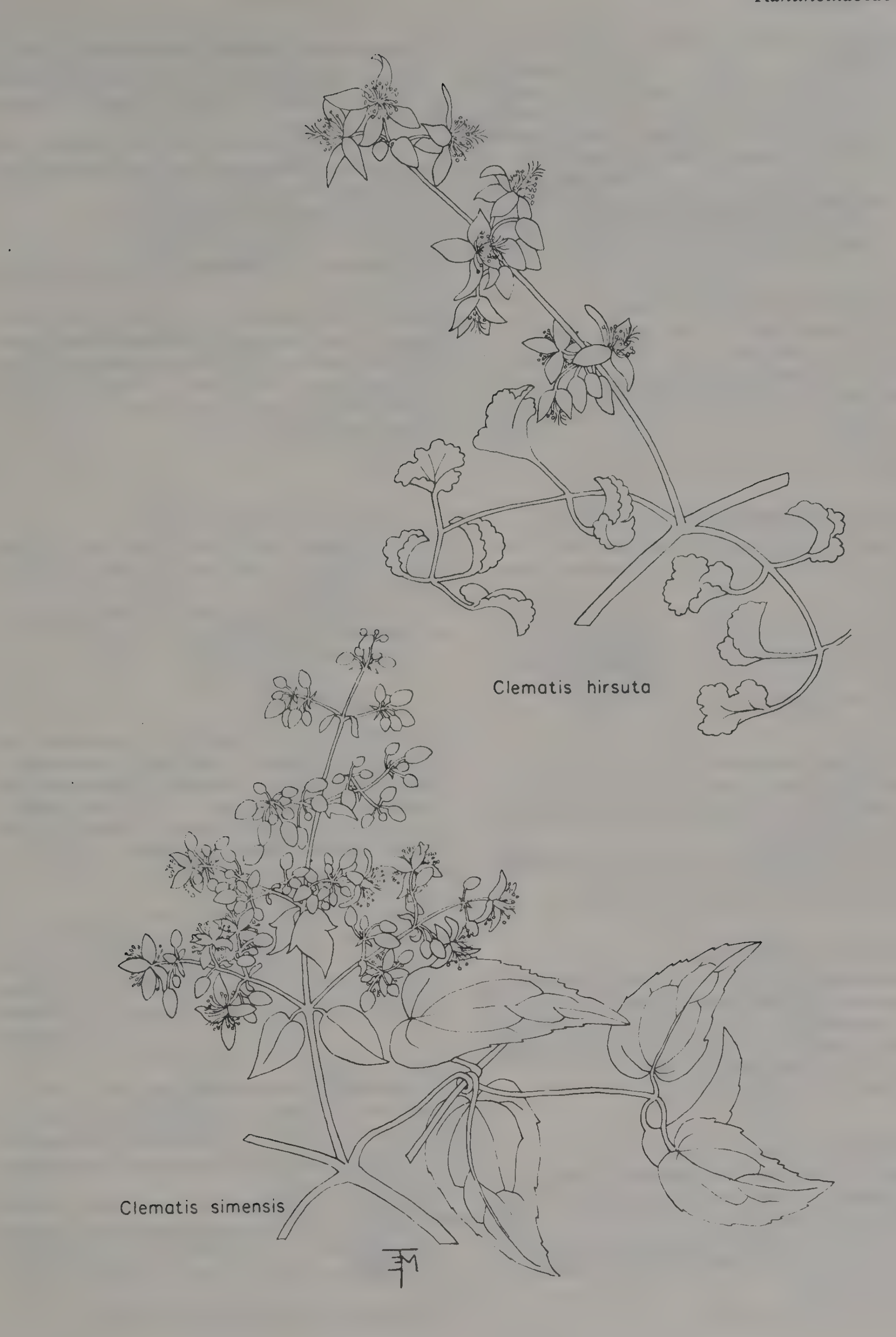
A common plant in moist or boggy (often rocky) situations on peat soil above 9000 ft. HE, HC, HA, HK, KIT.

Hanid 175; Hedberg 1678.

5. RANUNCULUS *L.*

Annual or perennial herbs with alternate, often palmate leaves; flowers solitary or inflorescence paniculate; flowers regular; sepals (3–) 5 in ours, herbaceous; petals often yellow, 5, free, with a basal nectary in a pit or below a scale on the upper side; stamens numerous, indefinite; carpels numerous, indefinite; fruit of achenes.

1 Leaves entire — 4. *R. volkensii*
  Leaves divided or cut — 2
2 Leaves simply pinnate — 1. *R. oreophytus*
  Leaves compound pinnate or ternate or trifoliolate — 3
3 Sepals spreading at anthesis — 4
  Sepals reflexed downwards at anthesis — 7
4 Petals white — 5. *R. stagnalis*
  Petals yellow — 5
5 Achenes very numerous (50–100) on a cylindrical receptacle; annual — 3. *R. sceleratus*
  Achenes fewer (less than 50) on rounded heads; perennial — 6


Clematis hirsuta
Clematis simensis

6 Leaves trifoliolate, with the terminal leaflet petiolate 8. *R. aberdaricus*
Leaves trisect, with no petiole to the terminal leaflet 7. *R. cryptanthus*
7 Creeping perennial of high altitudes (above 9000 ft); basal leaves trifoliolate 6. *R. keniensis*
Erect annual or perennial of 9000 ft and below; basal leaves ternate, with ternate or pinnate segments 2. *R. multifidus*

1. Ranunculus oreophytus *Del.* (see p. 79)

Perennial rosette herb with pinnate, usually glossy leaves; flowers solitary, yellow, in fruit becoming buried by the reflexion of the pedicel.

The most common alpine buttercup, found in close wet turf at altitudes above 9000 ft. HE, HC, HM, HA, HK.

Agnew 8161; Coe and Kirika 319.

2. Ranunculus multifidus *Forsk.* (see p. 79)

Perennial herb, sometimes stoloniferous, with bipinnate or bipinnatifid leaves; flowers numerous, yellow.

Our commonest 'buttercup' of streamsides at 4–8000 ft, also growing as a roadside weed in upland rain forest. HE, HC, HT, HA, NAN, MAC, NBI.

Strid 2469; Gillett 16272.

3. Ranunculus sceleratus *L.*

Annual herb with deeply 3-lobed leaves; flowers numerous, yellow; achenes very numerous, forming a cylindrical head.

An introduced weed of mud left by retreating water, not yet common. HA, RV, NBI.

Hanid and Kiniaruh 430; Gillett 16802.

4. Ranunculus volkensii *Engl.*

Stoloniferous creeping perennial with orbicular to reniform leaves; flowers solitary, yellow.

An uncommon alpine buttercup, apparently a pioneer of eroded wet hollows in peaty grassland, above 10 000 ft. HE, HM, HA, HK.

Agnew 7229; Polhill 12034.

5. Ranunculus stagnalis *A. Rich.*

Perennial rosette herb with ternately palmatisect to trifoliolate leaves; flowers numerous, white; fruiting pedicels reflexed.

An uncommon alpine or subalpine buttercup with white flowers, growing in marshy places near streams. HE, HK.

Hanid 146A; Hedberg 994.

6. Ranunclus keniensis *Milne-Redhead & Turrill*

Creeping perennial herb, with rosettes of trifoliolate leaves; flowers 1–3 together, hardly exceeding the leaves, yellow.

A creeping buttercup of wet ground near streams, easily overlooked, in the alpine zone of Mount Kenya only. HK.

Coe and Kirika 362; Moreau 128.

7. Ranunculus cryptanthus *Milne-Redhead & Turrill*

Similar to *R. keniensis* except for the heavier creeping stem, incompletely divided leaves, spreading sepals, and the fully reflexed pedicels in fruit.

A little-known buttercup confined to alpine Elgon where it grows in disturbed wet soil, often amongst rocks. HE.

Taylor 3542.

8. Ranunculus aberdaricus *Ulbr.*

Perennial stoloniferous rosette herb, with trifoliolate leaves and orbicular leaflets; flowers solitary, yellow.

A rare alpine buttercup of the Aberdares, needing confirmation on Mt. Kenya. HA, HK.

Kerfoot 1406A; Strid 2266.

6. DELPHINIUM *L.*

Perennial herbs with alternate, palmate-nerved leaves; flowers usually racemose, zygomorphic, usually blue; sepals 5, petaloid, the posterior sepal produced into a spur; petals 2–5, the two posterior elongated into the spur; stamens indefinite, often 9–15, often with flattened filaments; carpels 3–5, with many ovules; fruit of follicles.

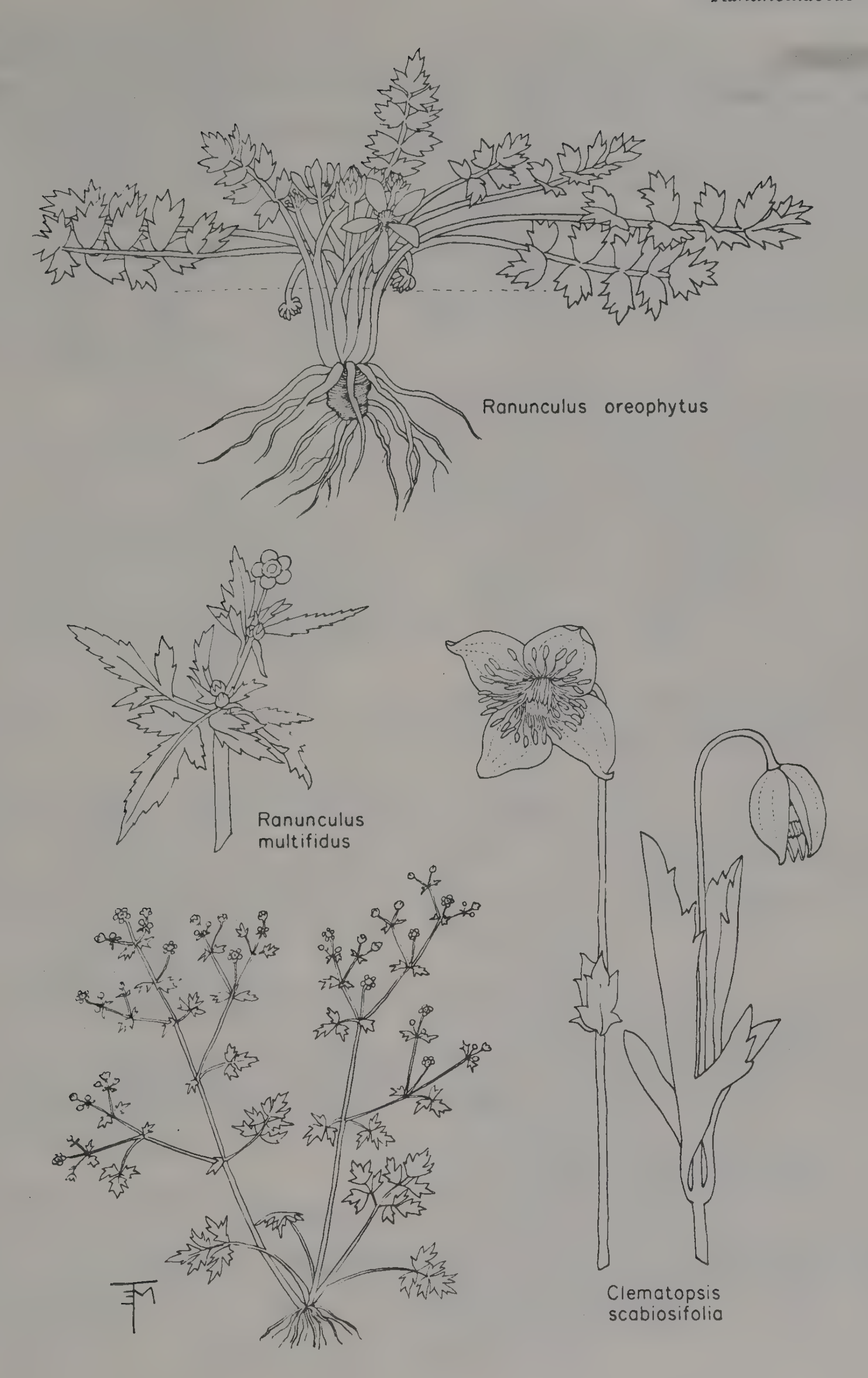
1 Flowers 4·5–6 cm diam., sweetly scented 2
Flowers 2·5–3 cm diam., with no smell 1. *D. macrocentrum*
2 Flowers 6 cm diam., sepals white 2. *D. leroyi*
Flowers 4·5 cm diam., sepals blue or mauve 3. *D. wellbyi*

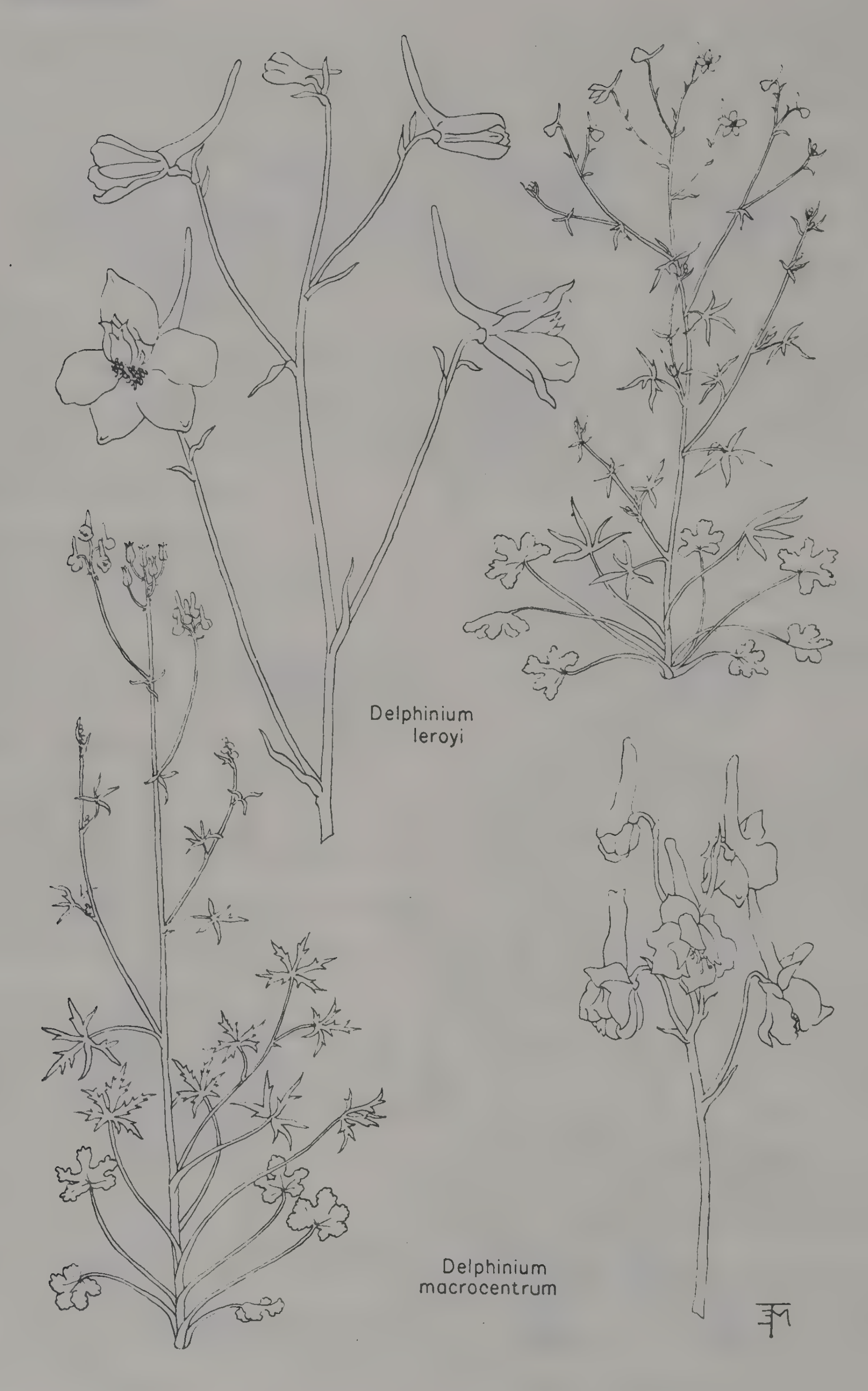
1. Delphinium macrocentrum *Oliv.* (see p. 80)

Erect herb, bearing deeply dissected, orbicular leaves; inflorescence 3–10-flowered; flowers with blue and/or metallic-green sepals and an ascending, stout spur.

A local but conspicuous plant when in flower with a most curious metallic-green sepal colour, which is found in moist (often rocky) grassland above 5000 ft. HE, HC, HM, HA, HK, KIT, KIS, NBI.

Leippert 5157; Lind and Harris 5099.


Ranunculus oreophytus
Ranunculus multifidus
Clematopsis scabiosifolia


Delphinium
leroyi
Delphinium
macrocentrum

2. Delphinium leroyi *Hutch.* (see p. 80)

Perennial herb bearing palmatifid or palmatisect leaves; flowers 4–9 in each raceme, with white sepals and upcurving spur.

An uncommon sweet-scented *Delphinium* of burnt savannah woodland. MUM, KAJ.

Greenway and Doughty 8532.

3. Delphinium wellbyi *Hemsl.*

Perennial herb, with palmatisect, orbicular leaves; flowers 3–7 in each raceme, with blue sepals and ascending spur.

A local plant so far only collected from the Meru district in upland grassland. HN, EMB

Bader 260.

4. CERATOPHYLLACEAE†

Submerged aquatic herbs with verticillate, divided leaves; flowers unisexual, monoecious, solitary in the whorls of leaves, sessile, the male and female at separate nodes; sepals green, numerous in one whorl; male flowers with 10–20 stamens, each with a produced, often coloured connective above the anthers; female flowers without staminodes, with one unilocular ovary with a pendulous ovule; fruit a spiny achene; seed without endosperm.

1. CERATOPHYLLUM *L.*

The only genus in the family, with the characters of the family.

1 Leaves twice forked (rarely 3-forked in occasional leaves within a plant); fruit smooth, with an apical spine and usually with two basal spines — 1. *C. demersum*
  Leaves 3-times, rarely 4-times forked; fruit rough, warty, with an apical spine but no basal spines — 2. *C. submersum*

1. Ceratophyllum demersum *L.*

Trailing, submerged glabrous herb, leaves mostly 10 in each whorl, twice forked, the segments toothed.

A common aquatic plant of slow-flowing streams and lakes below 8000 ft, usually free from the substrate, dying at the base as it grows at the apex. HT, MUM, RV, MAC.

Polhill 203; Agnew 5894.

2. Ceratophyllum submersum *L.*

Similar to *C. demersum* except for the leaves and fruits.

Rare, but probably overlooked, aquatic, only recorded from Amboseli. KAJ.

Verdcourt 3108.

† By A. D. Q. Agnew.

5. NYMPHAEACEAE‡

Aquatic, anchored herbs with usually floating, exstipulate, long-petiolate, simple, peltate leaves; flowers emergent from the water, bisexual; sepals 4–6; petals numerous, spiral, often intergrading with sepals or stamens; stamens numerous, spiral, with longitudinal anther dehiscence, and often with an appendage continuing the connective; carpels numerous, in one whorl, sunk in the receptacle, but nevertheless mostly free from each other; ovules 1–many in each carpel, often scattered on the walls; fruit often fleshy; seeds with fleshy arils.

1. NYMPHAEA *L.*

Aquatic herbs, often with tuberous rhizome; leaves palmate-nerved, hardly peltate but deeply cordate; sepals 4; petals 5–numerous; stamens perigynous, with petaloid filaments; anthers often appendaged at apex; carpels with many ovules; fruit fleshy, ripening under water; seeds small.

1 Leaves toothed; flowers white — 1. *N. lotus*
  Leaves entire or sinuate; flowers blue or mauve — 2
2 Leaves sinuate at margin with 8–11 primary nerves on each side of the midrib; stamens more than 100 — 2. *N. capensis*
  Leaves entire at margin or sinuate towards the base, with 5–8 primary nerves on each side of the midrib; stamens often less than 100 — 3. *N. caerulea*

1. Nymphaea lotus *L.*

Glabrous herb with tuberous rhizome and floating orbicular or suborbicular leaves; flowers white or cream.

An uncommon waterlily found in Lake Victoria. MUM, KIS.

Napier 5279.

2. Nymphaea capensis *Thunb.*

Similar to *N. lotus* except for the small leaves sinuate at margin, and the blue or mauve flowers.

One of our common blue water lilies. HA, KIT, MAC, NBI.

van Someren 3033.

3. Nymphaea caerulea *Savigny*

Similar to *N. capensis* except for the key characters.

One of our common blue water lilies. These two latter species are often difficult to distinguish, and further work is required to confirm their separation. HE, HT, MUM, RV.

Verdcourt 3100; Lind 5589.

‡ By A. D. Q. Agnew.

6. MENISPERMACEAE†

Dioecious, twining herbs or shrubs (rarely erect), with simple exstipulate leaves; flowers unisexual, small, usually in bracteate compound racemes; male flowers with 3–12 free green sepals, 0–6 petals, 3–6 or numerous stamens, the latter free or united; female flowers with sepals and petals as in the male flowers, stamens 0, carpels 3–6 (rarely 1) free; carpels with 2 ovules, becoming 1–seeded; fruit of free drupes, each carpel becoming circular by eccentric growth with a basal style, the bony endocarp being characteristically ridged; seed curved into a horse-shoe shape, with or without endosperm.

1 Leaves peltate 2
  Leaves not peltate 3
2 Leaves usually glabrous, with the petiole inserted, on some leaves at least, more than 1 cm from the margin 5. *Stephania*
  Leaves hairy, with the petiole never inserted more than 5 mm from the margin 6. *Cissampelos*
3 Leaves glabrous, at least when fully expanded 4
  Leaves hairy even when mature 6
4 Leaves cordate 4. *Tinospora caffra*
  Leaves not cordate 5
5 Pulvinus (a more or less swollen, ridged area) present on petiole below the lamina 1. *Tiliacora*
  No pulvinus present, the petiole smooth throughout 2. *Cocculus pendulus*
6 Flowers in one cluster or solitary at each node 2. *Cocculus*
  Flowers in raceme or clustered along a raceme 7
7 Leaves soft, often lobed, cordate with a parallel-sided or acute sinus 3. *Chasmanthera dependens*
  Leaves more or less stiff, never lobed, not cordate, or, if so, then the sinus obtuse, never acute 6. *Cissampelos*

1. TILIACORA *Colebr.*

Woody climbers, glabrous or glabrescent, leaves simple, with a pulvinus on the petiole below the blade, and thus held horizontally however the branch is orientated; male inflorescence of racemes of condensed cymes, few-flowered; male flowers with 6–12 sepals in several whorls, 3–6 petals, 3–9 free or partly united stamens; female inflorescences as the male, but sometimes spikes of solitary flowers; female flowers with sepals and petals similar to the male, and 6–30 carpels on a gynophore; drupes ovate, stipitate, the endocarp being compressed and furrowed.

1 Female inflorescence of spikes of solitary flowers; leaves long acuminate 1. *T. keniensis*
  Female inflorescence of racemes of 3–9-flowered cymes; leaves not long acuminate 2. *T. funifera*

1. Tiliacora keniensis *Troupin*

Glabrous woody climber with ovate-oblong leaves; male plants unknown; female inflorescences from old wood, of spikes of solitary flowers.

Obviously a rare plant that needs more collecting to establish its characters, for it may prove to be but a variant of the next species. MUM, MAC.

Faden, s.n.

2. Tiliacora funifera (*Miers*) *Oliv.*

Woody climber with ovate-oblong to ovate leaves; inflorescences of either solitary axillary cymes or in 3–9-cymed clusters on racemes from the old wood.

Uncommon, in lowland rain-forest west of the Rift, collected from Kakamega; also one specimen exists from Emali Hill. MUM, KAJ.

van Someren 91; Dale 3130.

2. COCCULUS *DC.*

Woody climbers; leaves simple, entire or lobed; male inflorescences of short pedunculate cymes either solitary or clustered, on leafy or leafless branches; male flowers with 6 sepals in two whorls, 6 petals auriculate and ± surrounding the outer stamens, and 6–9 free stamens; female inflorescences similar to the male; female flowers similar to the male, with staminodes present or absent, and 3–6 carpels with spathulate stigmas; endocarp of fruit crested or not.

1 Leaf lamina usually glabrous or slightly pubescent, with 3 basal nerves 1. *C. pendulus*
  Leaf lamina usually tomentose or pubescent, with 5 basal nerves 2. *C. hirsutus*

1. Cocculus pendulus (*J. R. & G. Forst.*) *Diels*

Woody climber with ovate to elliptical leaves; inflorescences axillary of short-peduncled cymes of sessile flowers.

An uncommon climber of riverine vegetation in dry bushland of northern Kenya, only doubtfully found in our area. NAN.

Verdcourt 3789.

† By A. D. Q. Agnew.

2 Cocculus hirsutus (*L.*) *Diels*

Large woody climber with ovate to elliptic leaves, otherwise similar to *C. pendulus.*

An uncommon climber found in the dry areas of Kenya, particularly in riverine vegetation in *Acacia/Commiphora* bushland. MAG.

Glover and Samuel 3259.

3. CHASMANTHERA *Hochst*

Woody climbers; leaves simple or obscurely lobed, suborbicular with palmate nervation; male inflorescences of pendulous racemes of spaced clusters of short-pedicellate cymes subtended by filiform bracts; male flowers with 6 sepals in two whorls, 6 rather fleshy petals and 6 stamens with fused filaments; female inflorescences of pendulous racemes; female flowers similar to the male, with 6 staminodes and 3 carpels; endocarp of fruit 3-toothed at apex, ridged down centre line and with 2 narrow lateral wings.

Chasmanthera dependens *Hochst.*

Woody tomentose climber with soft, almost succulent stems, and orbicular or obscurely lobed leaves.

An uncommon climber of the Kitui district in *Acacia/Combretum/Commiphora* woodland on sandy soils. MAC.

Gillett 16944.

4. TINOSPORA *Miers*

Woody or herbaceous climbers or shrubs; leaves simple, entire, with palmate nervation; male inflorescences of racemes or panicles of 2–4-flowered cymes; male flowers with 6 sepals in two whorls, 6 fleshy petals, and 3–6 fused or free stamens; female inflorescences of racemes of solitary flowers; female flowers similar to the male, sometimes with staminodes, with 3 carpels; endocarp of fruit rough on outside, with a large cavity on inner face.

Tinospora caffra (*Miers*) *Troupin*

Herbaceous or woody glabrous climber with orbicular to ovate leaves, inflorescences sometimes panicled.

A widespread but local climber, sometimes trailing over rocks, in dry woodlands. KIT, MUM, KIS, BAR, MAC.

Agnew 8091; Bally 11417.

5. STEPHANIA *Lour.*

Herbaceous, woody or succulent climbers; leaves simple, mostly orbicular, more or less deeply peltate; male inflorescences paniculate or umbel-like, male flowers with 6–8 sepals, 3–4 free petals (rarely absent), and 2–6 stamens inserted on a stalked disc; female inflorescences similar to the male; female flowers with 3–6 sepals, 2–4 free petals, staminodes absent, and 1 carpel; endocarp of fruit with 2–4 rows of tubercles, prickles, or ribs.

1 Stem succulent — 1. *S. cyanantha*
Stem woody or herbaceous, not succulent — 2. *S. abyssinica*

1. Stephania cyanantha *Hiern*

Glabrous succulent climber with triangular to orbicular, acuminate leaves; inflorescences in apparent umbels on leafless stems.

Rare plant of montane forest edges. HE, HN, KIS.

Kerfoot 4375.

2. Stephania abyssinica (*Dillon & A. Rich.*) *Walp.*

Similar to *S. cyanantha* but not succulent, and with tuberculate, not ribbed, fruit endocarp.

The commonest member of the Menispermaceae found in mountain rain forest, extending through the bamboo zone. The species is variable, the hairy individuals being known as var. *tomentella.* HE, HT, HM, HA, HK, MUM, KIS, KIT, NAR, KAJ.

Williams 604; Agnew 8673.

6. CISSAMPELOS *L.*

Woody or herbaceous twining climbers; leaves simple, peltate or almost so, entire; male inflorescences similar to those in *Stephania*; male flowers with 4–5 sepals, fused petals forming a cup, 4–10 stamens fused together, female inflorescences of short-pedicelled cymes spaced out on a hanging raceme with specialized bracts, or axillary; female flowers of 1 sepal, 1 petal, and 1 lateral carpel; drupes hairy or glabrous, with a dorsally ridged endocarp.

1 Leaves acuminate, rounded or cuneate at base, not cordate — 1. *C. friesiorum*
Leaves obtuse or rounded at apex, truncate to cordate at base — 2
2 Leaves orbicular or suborbicular, usually not acutely cordate, apex often retuse, soft papery, usually nearly concolorous on both surfaces — 2. *C. pareira*
Leaves heart-shaped or subreniform, usually cordate, never retuse at apex, hard leathery, the lower side covered with a thick felty indumentum and usually paler than the upperside — 3. *C. mucronata*

1. Cissampelos friesiorum *Diels*

Climbing tomentose herb with ovate leaves; male cymes axillary, clustered 2–3 together, female plants unknown.

A rare climber from the rain forest near Meru, badly in need of more collection. HK.

Conrads in EAH. 10434.

2. Cissampelos pareira *L.*

Herbaceous climber with peltate, orbicular or almost reniform leaves; male inflorescences of loose corymbose cymes, female inflorescences of 5–9-flowered axillary cymes.

The most common Menisperm of all forest and woodland areas outside the area of wetter montane forest. HE, HC, HA, MAC, NBI.

Verdcourt 636; Lugard 497.

3. Cissampelos mucronata *A. Rich.*

Herbaceous or woody hairy climber, with peltate heart-shaped leaves, male inflorescence of 3–6 clustered axillary cymes or racemes; female inflorescences with fused, often long-mucronate bracts.

A common swampland plant west of the Rift Valley, rarer in the east. The hard leathery leaves distinguish it immediately from *C. pareira.* HE, HA, KIT, MUM, KIS, NAR.

Gillett 16362; Agnew 9586.

7. ARISTOLOCHIACEAE†

Herbs or shrubs, often climbers, with alternate, simple, exstipulate leaves, often cordate at base; flowers bisexual, often zygomorphic, solitary, axillary, often with a foetid smell; sepals often produced in a long tube, often asymmetrically 3-lobed above; petals 0; stamens 6–many, fused to the style, with longitudinal dehiscence of the anthers; ovary inferior with 6 carpels, with the styles connate into a column above; ovules parietal or axile, numerous; seeds with much endosperm.

1. ARISTOLOCHIA *L.*

Herbs, shrubs or climbers; sepal tube dilated into a chamber below, and often zygomorphically dilated above; stamens 6 or more, fused to the styles; ovary inferior, with 6 carpels; placentation axile or parietal; fruit a capsule.

1 Climbing plant with entire leaves — 1. *A. densivenia*
Prostrate or erect rhizomatous herb with crenulate leaf margins — 2. *A. bracteata*

1. Aristolochia densivenia *Engl.*

Twining glabrous herb with ovate leaves; flowers green at base, blue above, borne on specialized raceme-like stems with sessile cordate bracts.

A rare plant of dry land, not yet definitely recorded for our area, but known from riversides near Meru.

Adamson 592.

† By A. D. Q. Agnew.

2. Aristolochia bracteata *Retz.*

Prostrate or erect rhizomatous glabrous herb, with orbicular to reniform leaves; flowers dark mauve to cream-coloured, solitary.

Also a rare plant, not yet definitely recorded for our area. A specimen from Marsabit (which cannot be from the mountain), may be from our area, and it should be looked for in the driest country. ?NAN.

Williams and Adamson in EAH 11011.

8. HYDNORACEAE‡

Evil-smelling parasites, without chlorophyll, growing on the roots of trees and shrubs by means of a pseudo-rhizome with haustoria; pseudo-rhizome warty, simple or branched, rounded or angled; leaves and scale-leaves 0; flowers large, solitary, epigeous; calyx thickened, fleshy, valvately 3–5 lobed; stamens 3–5, inserted on the calyx tube and united to form a ring around the stigma; anthers numerous, sessile; ovary inferior, 1-locular with numerous apical or parietal placentas, ovules numerous, stigma sessile or rudimentary; fruits underground, baccate; seeds numerous, very small, in glutinous pulp.

1. HYDNORA *Thunb.*

Pseudo-rhizomes brown externally, red internally, covered completely, or on londitudinal ridges only, by warts; flowers sessile on the pseudo-rhizome, 9–30 cm long, brown outside, bright-red or rose inside, calyx tubular, with lanceolate lobes which are often joined toward the summit; inner surface of lobes ciliate or glabrous; stigma 3–5-lobed.

Hydnora abyssinica *Schweinf.* (*H. johannis* Becc.)

A parasite with the underground pseudo-rhizome cylindrical or obscurely angled, completely covered with warts and large flowers with a very strong unpleasant smell; calyx very fleshy, 4-lobed, the inner surface apically cream and bright red and bristly below.

A very distinct and uncommon species of dry *Acacia* bushland, parasitic, often on *Acacia* roots, with only the flowers above the ground surface. MAG, NBI.

Napper 1220.

9. PIPERACEAE§

Herbs, sometimes shrubby, and climbers; leaves entire, alternate or opposite, stipulate or not, often fleshy; inflorescence a spike usually with

‡ By D. Wood.
§ By A. D. Q. Agnew.

crowded flowers; flowers bisexual or unisexual, subtended by a peltate bract; perianth absent (in ours) or present, in one whorl; stamens 2–6, with free filaments; ovary superior, with one ovule (in ours); fruit an indehiscent berry; seeds with much endosperm.

1 Trailing herbs, mostly epiphytic, without stipules; leaves not aromatic, often fleshy 1. *Peperomia*
Shrubby herbs or climbers with stipules adnate to petiole; leaves often aromatic when crushed, hardly fleshy 2. *Piper*

1. PEPEROMIA *Ruiz & Pav.*

Herbs, often epiphytic; leaves alternate or opposite, without stipules, not aromatic when crushed, often fleshy; flowers bisexual in usually dense spikes; perianth absent; stamens 2; fruit a berry, but the carpel wall always thin, sometimes glandular.

1 All or most leaves opposite or whorled 2
All or most leaves alternate 3
2 Leaves glabrous, whorled usually in fours 1. *P. tetraphylla*
Leaves hairy, opposite 2. *P. arabica*
3 Leaf lamina 2 cm long or smaller; creeping plants usually with decumbent flowering stems 4
At least some leaf laminae more than 2 cm long; flowering shoots erect 5
4 Leaves orbicular; spikes not more than 1 cm long 3. *P. bangroana*
Leaves elliptical; spikes more than 1 cm long, at least in fruit 4. *P. mannii*
5 Stems tomentose or glabrous; leaves constant in shape within one plant, elliptic, narrowing equally at base and apex, with the widest part often equidistant from both; fruits spherical, symmetrical 6. *P. butaguensis*
Stems glabrous; leaves variable within one plant, usually oblanceolate or obcordate, cuneate at base, rounded or obtuse at apex, never *all* elliptic; fruits ellipsoid, asymmetric 5. *P. abyssinica*

1. Peperomia tetraphylla (*Forst.*) *Hook. & Arn.* (see p. 87)

Epiphytic, glabrous, creeping herb with fleshy, whorled, orbicular or elliptic leaves; spikes pubescent.

A common epiphyte of wet highland forest and occasionally found in the drier savannah edges of such forest forming mats on horizontal tree branches. HE, HC, HT, HM, HA, HN, KIT, MAC, KAJ.

Agnew 7915; Gillett 13893.

2. Peperomia arabica *Miq.*

Pubescent to tomentose fleshy herb, with opposite elliptic leaves.

A rare plant, restricted to certain drier districts, and found rarely as an epiphyte, more often growing on the ground amongst rocks. NAR, MAC.

Glover, Gwynne, and Samuel 12.

3. Peperomia bangroana *C. DC.*

Trailing tomentose epiphytic herb with small orbicular leaves; spikes to 1 cm long, exceeding the leaves.

Creeping, diffuse plant growing often amongst moss on horizontal tree branches. It seems curiously restricted in distribution, but may be overlooked. KIS.

Ossent 682; Glover, Gwynne, Samuel, and Tucker 2553.

4. Peperomia mannii *Hook. f.*

Trailing epiphytic herb with glabrescent, elliptic to obcordate leaves.

Rather uncommon epiphyte only found in the wettest highland forest, between 6500 and 8500 ft. HA, HK, HN.

Verdcourt and Polhill 2937; Agnew 5865A.

5. Peperomia abyssinica *Miq.* (see p. 87)

Glabrous herb, trailing at base, with ascending stems, and usually oblanceolate or obcordate leaves with the widest part above the middle; fruit asymmetric, ellipsoid.

The most common and most variable *Peperomia* in wet upland forest at nearly all altitudes below 9000 ft in our area. The plant often grows on the ground as well as epiphytically, as on the Ngong Hills. HE, HC, HT, HM, HA, HN, HK, KIT, MUM, KIS, RV.

Agnew 8767; Dale 54.

6. Peperomia butaguensis *De Wild*

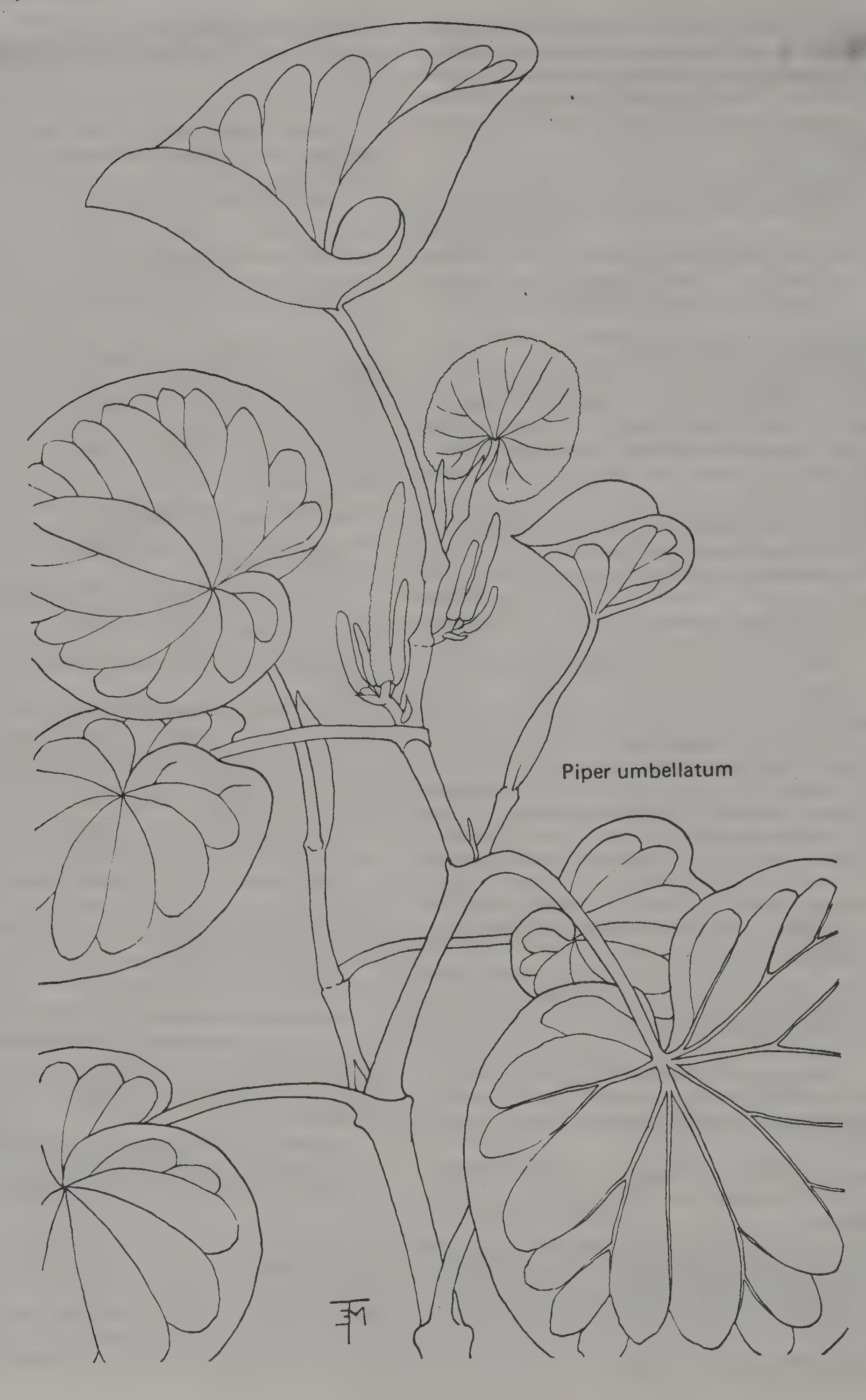
Glabrous or tomentose herb similar to *P. abyssinica* except for the usually elliptic, acute leaves, mostly widest about the centre, and spherical, symmetrical fruits.

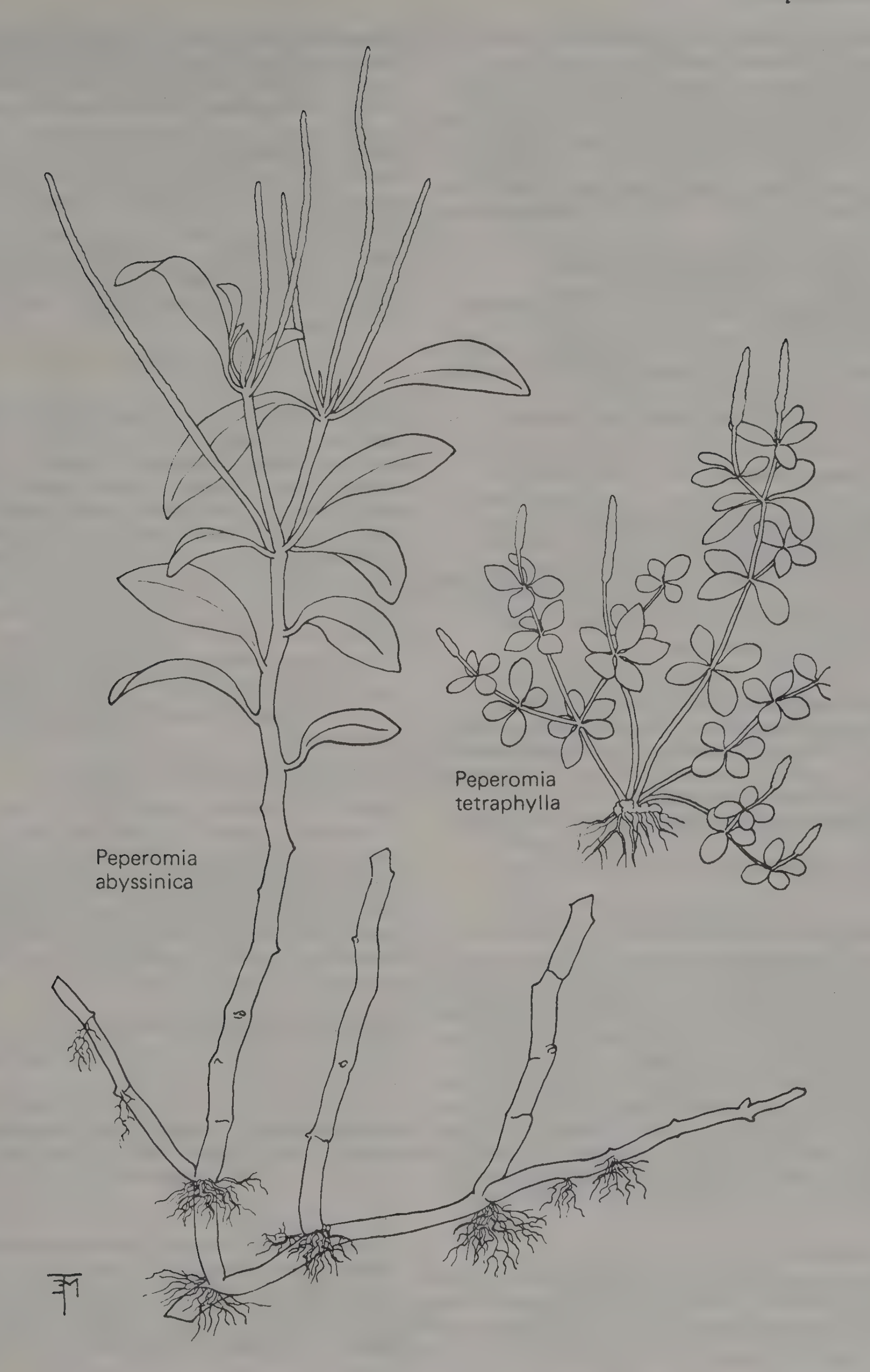
Apparently common in the wet highland forests west of the Rift Valley. HM, MUM, KIS.

Kerfoot 2724; Hanid and Kiniaruh 1041.

2. PIPER *L.*

Shrubby herbs or climbers, often glabrous with jointed nodes, leaves alternate, with stipules adnate to petiole, lamina aromatic when crushed; inflorescence a spike (in ours) or raceme of unisexual or bisexual flowers; flowers with no


Piper umbellatum


Peperomia
tetraphylla
Peperomia
abyssinica

perianth, 2–4 stamens; fruit a berry, stalked or sunk in the rachis of the spike.

1 Erect soft shrubs; fruits sessile — 2
Climber; fruits stalked — 1. *P. guineense*
2 Spikes solitary; fruits exceeding the bracts — 2. *P. capense*
Spikes 2–6 together; fruits not exceeding the bracts — 3. *P. umbellatum*

1. Piper guineense *Schumach. & Thonn.*

Soft shrubby glabrous climber, with ovate leaves and solitary spikes.

A rare plant (in our area) only found in Kakamega forest and climbing by means of adventitious roots near the nodes. MUM.

Gillett 16682; Strid 2906.

2. Piper capense *L.*

Tall, soft shrub or herb, with broad-ovate to orbicular, cordate, sparsely tomentose leaves, and solitary whitish spikes.

A common undergrowth plant of wetter highland forests from 5000 to 9000 ft. HE, HM, HA, HK, HN, MUM, KIS, RV, EMB, MAC, KAJ.

Kabuye 64; Agnew 9810.

3. Piper umbellatum *L.* (see p. 86)

A soft shrub similar to *P. capense* from which it differs in being glabrous, and in having orbicular, hardly acuminate leaves, and spikes in axillary umbels of 2–6.

Common in the wetter forests of Kenya. HN, MUM.

Polhill and Verdcourt 290; Agnew 5884.

10. PAPAVERACEAE†

Herbs, rarely shrubs or small trees, with coloured latex; leaves exstipulate, alternate, rarely whorled, divided, rarely entire; flowers bisexual, regular; sepals 2–3, imbricate, green, usually free or calyptrate, caducous; petals showy, usually 4 or 6, imbricate, in 1–2 or 3 whorls, crumpled in the bud, deciduous; stamens mostly numerous; ovary superior, usually 1-celled; ovules numerous, parietal; fruit a capsule, dehiscing by valves or pores; seeds small, numerous, with fleshy or oily endosperm.

1. ARGEMONE *L.*

Glaucous often prickly herbs or shrubs; leaves sessile, pinnately lobed or incised; flowers large, solitary or cymose; sepals with a subterminal terete horn, outer surface sparsely prickly; petals 6, in 2 whorls of 3, white or yellow; ovary with 3–7 carpels; capsule dehiscing by valves; seeds brown-black, pitted, up to 3 mm in diameter.

Argemone mexicana *L.*

Erect herb with yellow latex and amplexicaul, white-veined, roughly oblong leaves and bright-yellow flowers.

Weed of waste, dry places, roadsides and abandoned cultivated ground, this is the "Mexican Poppy" introduced from America. HA, NBI.

Verdcourt 3230; Agnew 8741.

11. FUMARIACEAE‡

Herbs, sometimes climbing; leaves exstipulate, alternate or radical, finely divided, sometimes ending in a branched tendril; flowers in racemes or spikes, rarely solitary, zygomorphic, bisexual; sepals usually 2, caducous; petals usually 4, one or both of outer ones spurred or saccate, inner segments often united at the apex; stamens 6 in 2 bundles; ovary 1-celled, with 2 parietal placentas, each with 1-many anatropous ovules; fruit a capsule or nutlet; seeds endospermous.

1 Flowers yellow, fruit an elongate capsule with many seeds — 1. *Corydalis mildbraedii*
Flowers white to pink; fruit a semi-globular nutlet — 2. *Fumaria abyssinica*

1. CORYDALIS *Vent.*

Annual or perennial herbs with tap roots, tubers, or rhizomes; leaves alternate or rarely opposite, simple to variously divided; bracts persistent; flowers yellow, rarely red or purple; stigma persistent, flattened and lobed; style filiform; fruit a bicarpellate and 2-valved capsule; seeds numerous, orbicular to reniform, smooth to pitted, with a caruncle.

Corydalis mildbraedii *Fedde* (see p. 91)

Glabrous and glaucous perennial herb with much divided leaves; flowers yellow.

An uncommon plant found in upland forests, moors, and grasslands, often at forest edges or near streams from 7000–10 000 ft. HE, HM, HA, HK.

Verdcourt 2057; Agnew 9066.

2. FUMARIA *L.*

Annual herbs; leaves cauline, 2–4-pinnatisect; tendrils absent; petiolule and rachis sometimes prehensile; inflorescence in leaf-opposed racemes with persistent bracts; flowers white to pink, usually the 4 petals dark pink to purple at apex,

† By M. A. Hanid.

‡ By M. A. Hanid.

upper petals spurred, lower petals ± spathulate; ovule 1; fruit a nutlet, smooth or rugose when dry.

Fumaria abyssinica *Hamm.* (see p. 91)

Erect or straggling herb with 2–3-times pinnatisect glabrous leaves, leaflets oblong-lanceolate to linear-lanceolate; flowers pink; fruit spherical.

Uncommon plant found in upland rain-forest, bamboo-forest, and upland moor, often a weed of cultivation and more rarely of roadsides; 4000–9500 ft. HE, HT, HM, HA, HK.

Verdcourt 3207; Agnew 10119.

12. TURNERACEAE†

Herbs, shrubs or trees, with simple, usually exstipulate, alternate leaves; flowers bisexual, regular, often dimorphic, solitary to numerous, mostly axillary, in racemes, panicles, or cymes; calyx tubular, 5-merous, teeth imbricate; petals and stamens 5, both inserted on the calyx-tube; ovary superior, 1-celled with 3 parietal placentas; styles 3, stigma apically divided; fruit a 3-valved capsule; seeds arillate, pitted, endospermous, with 2-pored pits in ours.

1 Shrubs, 1–3 m tall — 1. *Loewia*
  Herbs, 0·3–0·4 m tall — 2
2 Seeds straight; capsule dehiscing irregularly, not from apex downwards — 2. *Wormskioldia*
  Seeds curved; capsule dehiscing from apex downwards — 3. *Streptopetalum*

1. LOEWIA *Urb.*

Shrubs, indumentum glandular, densely hirsute or pubescent, often with stellate hairs; bracts foliaceous; flowers solitary in upper leaf axil, erect, trumpet-shaped, bibracteolate; calyx tubular for half its length or more; petals white, yellow, or bright orange, inserted near the opening of calyx-tube; capsule narrowly obovoid, dehiscing loculicidally from apex downwards, shortly beaked; seeds several, curved.

Loewia tanaensis *Urb.*

Small shrub with obovate leaves and orange flowers, found in dry bushland and doubtfully recorded for our area. KIS.

Steele 3979.

2. WORMSKIOLDIA *Schum. & Thonn.*

Herbs, pubescent or puberulous and setiferous; leaves sometimes glandular; inflorescences axillary or of scapose, one-sided racemes; bracteoles single or paired; pedicel accrescent, sometimes curved; flowers erect, heterostylous; hypanthium 0·3–1·5 mm long; petals yellow to scarlet, each with a ligule at its base; stamens arising from the base of calyx tube, filaments winged, adnate to calyx for up to 2 mm, 2 shorter, 3 longer (in ours); capsules linear or narrowly ellipsoid, often held horizontally or reflexed, dehiscence not from apex downwards but irregular; seeds many, straight.

1 Leaves with a pair of pubescent glands at the base; bracteoles pubescent, up to 1 mm long; capsules glabrous — 1. *W. lobata*
  Leaves without basal glands; bracteoles glabrous, 2–6 mm long; capsules shortly setiferous — 2. *W. pilosa*

1. Wormskioldia lobata *Urb.*

Annual herb with elliptic leaves; inflorescence of 1–4 yellow flowers; capsule glabrous with 2–5 mm long beak.

A locally common plant of open situations in bushland amongst short grass on rocky outcrops, ironstone and sandy soils; more collections needed. BAR, MAC.

Napper 1600; Tweedie 67/624.

2. Wormskioldia pilosa (*Willd.*) *Urb.*

Annual herb with elliptic, pinnatipartite leaves; inflorescence of 2–4 yellow to orange flowers; capsules shortly setiferous with 4–7 mm long beak.

A plant of rocky places, roadsides, and cultivated land, badly in need of collection. KIS.

Wilson 353.

3. STREPTOPETALUM *Hochst.*

Pubescent and setiferous herbs; leaves glandular or exstipulate; inflorescence axillary, 1- to many-flowered, usually in a one-sided raceme; bracteoles single or obscure; pedicels sometimes accrescent; flowers erect, sometimes heterostylous, hypanthium ± 3 mm long; calyx tube hairy within for 3–6 mm from base, bearing 5 large tubercles above the insertion of stamens; petals yellow or orange, adnate to calyx for more than half the length of the tube, eligulate; filaments winged; capsules broadly ellipsoid, subovoid or suborbicular, erect, dehiscing loculicidally from apex; seeds numerous, curved.

1 Annual herb; stem-setae bulbous-based; heterophyllous; capsule shortly and regularly setiferous — 1. *S. serratum*
  Perennial herb; stem-setae not bulbous-based; homophyllous; capsule pubescent and irregularly setiferous — 2. *S. hildebrandtii*

† By M. A. Hanid.

1. Streptopetalum serratum *Hochst.*

Annual herb with narrowly elliptic leaves; inflorescence of 1-9 yellow or orange flowers; capsule broadly ellipsoid.

An infrequent herb of sandy soil among rocks in wooded grassland. BAR.

Bally 4531; Tweedie 67/263.

2. Streptopetalum hildebrandtii *Urb.*

Perennial herb with narrowly elliptic leaves; inflorescence of 3-5 yellow or orange flowers; capsule broadly ellipsoid.

An uncommon plant of open grassland and scattered-tree grassland. MAC, KAJ.

Gillett and Faden 18 256; Bally 24704.

13. CAPPARACEAE†

Herbs, shrubs, trees, or lianes; leaves mostly alternate, stipulate, simple or digitately 2-9-foliolate; inflorescences terminal or axillary, usually racemose, or flowers solitary or fascicled, often showy, regular, bisexual; sepals 4-8, free; petals 4-16 or absent; stamens few to many, borne on an androphore, staminodes present or absent; ovary sessile or borne on a gynophore, 1-celled or divided into 2 or more loculi by intrusive placentas; style short or absent; fruits various, mostly a capsule or berry, few- to many-seeded; seeds reniform or angular, usually non-endospermous, cotyledons folded or convolute.

1 Annual or perennial herbs 2
  Trees, shrubs, or woody herbs 3
2 Androphore absent, i.e. stamens not inserted on an elongated stalk 1. *Cleome*
  Androphore longer than the corolla, i.e. stamens inserted on an elongated stalk 2. *Gynandropsis gynandra*
3 Scrambling shrub with 2 stipular thorns at the base of each leaf, sepals dissimilar or unequal 3. *Capparis*
  Spreading shrubs or woody herbs without thorns, sepals similar and equal 4. *Maerua*

1. CLEOME *DC.*

Annual or perennial herbs, sometimes bushy and woody below; leaves petiolate, alternate, simple or digitately 3-9-foliolate, leaflets with very short petiolules; flowers ± zygomorphic, pedicellate, bracteolate, in terminal racemes; sepals 4; petals 4, equal or unequal, often long-clawed; androphore absent; stamens free; ovary 1-celled with many parietal ovules; fruit a siliquiform capsule with 2 dehiscing valves, smooth or longitudinally nerved.

† By A. D. Q. Agnew and M. A. Hanid.

1 Leaves simple 1. *C. monophylla*
  Leaves digitately compound 2
2 Plant glabrous, staminodes present 2. *C. angustifolia*
  Plant hairy, staminodes absent 3
3 All leaves 3-foliolate; gynophore absent or up to 2 mm long; all bracts nearly as long as the leaves 4. *C. schimperi*
  Some leaves more than 3-foliolate; gynophore present, more than 2 mm long; all or some bracts shorter than the leaves 4
4 Stem and leaves covered with bristly glandular hairs 3. *C. strigosa*
  Stem and leaves covered with gland-tipped hairs 5
5 Gynophore longer than the pedicel; stamens 6-8; seeds minutely puberulent 5. *C. allamanii*
  Gynophore shorter than the pedicel; stamens 10-12; seeds glabrous 6. *C. hirta*

1. Cleome monophylla *L.* (see p. 91)

Erect annual herb, usually branched, usually with lanceolate or oblong, pubescent leaves; petals usually pink or mauve; capsule with glandular and simple hairs.

A common plant in grassland, decidous woodland, bushland, and on lake-shores; often a weed of cultivated and disturbed ground. HE, HT, KIT, MUM, BAR, RV, EMB, MAC, NBI, KAJ.

Gillett 16605; Hanid 537.

2. Cleome angustifolia *Forsk.* (*C. diandra* Burch.)

Slender, glaucous, erect herb, with 3-9-foliolate leaves and filiform-linear leaflets; petals unequal, yellow, mauve at the base; capsule valves glabrous.

A handsome and distinct species found in bushland, grassland, and semi-desert scrub, with a tendency to become a weed of stony ground. HA, MAG, KAJ: below 3600 ft.

Rauh Ke 112; Isaac, December 1961.

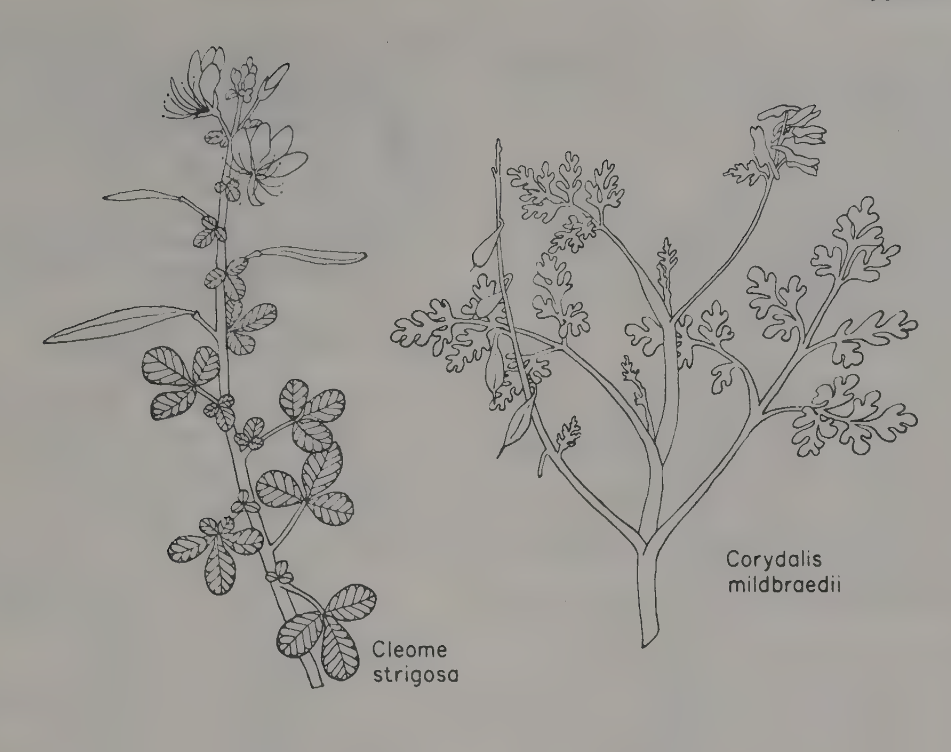
3. Cleome strigosa (*Boj.*) *Oliv.* (see p. 91)

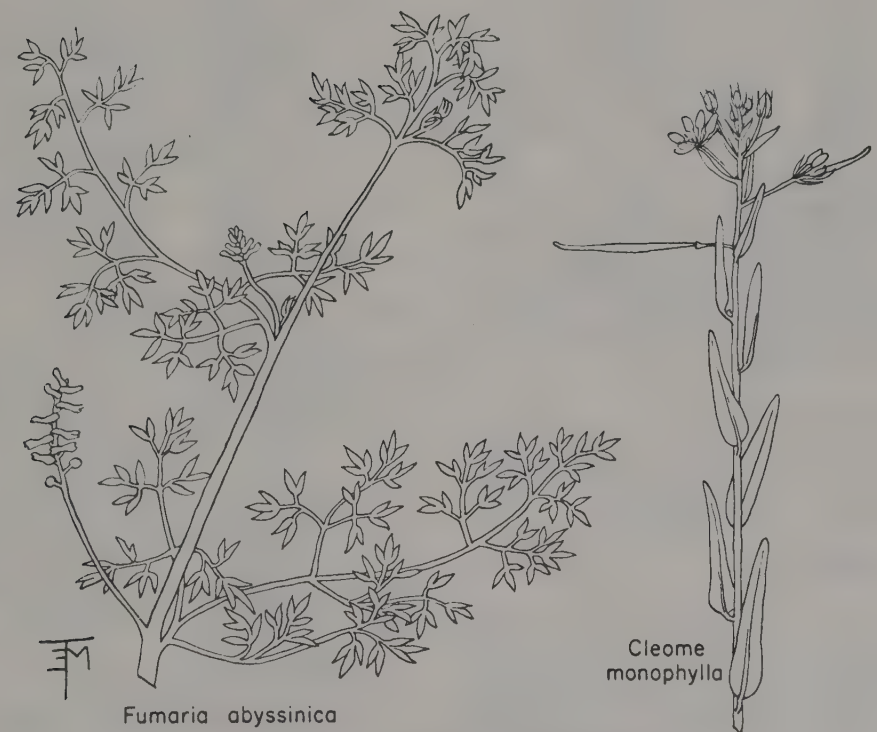
Eglandular annual with 3-5-foliolate leaves and obovate leaflets; petals purplish pink, upper pair yellow at the base.

Only one specimen collected by Dowson in 1914 from Nairobi area, possibly adventive from coast. NBI.

4. Cleome schimperi *Pax*

Annual with glandular or eglandular hairs and 3-foliolate leaves with elliptic leaflets; petals pink; capsules with gland-tipped hairs.


Corydalis mildbraedii
Cleome strigosa


Cleome monophylla
Fumaria abyssinica

A local plant of upland rain-forest margins, often a weed of cultivated land; 2000-6300 ft. HT, HM, HA, HN, MUM, KIS.
Polhill and Verdcourt 262.

5. Cleome allamanii *Chiov.*

Annual, glandular or glabrous, viscid, with 5-7-foliolate leaves and narrowly linear leaflets; petals magenta-pink, upper pair yellow-spotted.
A plant of dry areas growing on sandy and rocky ground. NAN, MAC.
Gillett 16418.

6. Cleome hirta (*Klotzsch*) *Oliv.* (see p. 93)

Annual or short-lived perennial glandular herb with 5-9-foliolate leaves and linear leaflets; petals purplish or pink, paler towards the base.
A common plant of open woodlands and grasslands, becoming a weed of roadsides and cultivated ground; below 5400 ft. HK, KIT, MUM, BAR, RV, MAG, NAN, MAC, NBI, KAJ.
Greenway and Kanure 12901; Tweedie 67/88.

2. GYNANDROPSIS *DC.*

Annual herbs, rarely rather shrubby; leaves petiolate, 3-7-foliolate; inflorescence a terminal raceme, bracts foliaceous; sepals 4; petals 4, clawed; androphore conspicuous, slender, elongate; stamens 6, free; staminodes absent; gynophore short; ovary 1-celled; ovules many, parietal; capsule dehiscent with 2 valves with persistent placentas; seeds reniform, testa reticulate or rugose.

Gynandropsis gynandra (*L.*) *Brig.* (see p. 93)

Glandular or glabrescent annual with obovate to elliptic leaflets; petals white, pale pink, or lilac.
A common weed of cultivated ground and roadsides, found below 7200 ft. HE, HC, HK, KIT, MUM, KIS, NAR, BAR, RV, MAC, NBI, KAJ.
Greenway 9674; Hanid 548.

3. CAPPARIS and 4. MAERUA

These genera are represented here mostly by shrubs, with several climbers and scramblers, all of which are dealt with in KTS, pp. 117-20 (*Capparis*) and pp. 123-7 (*Maerua*).

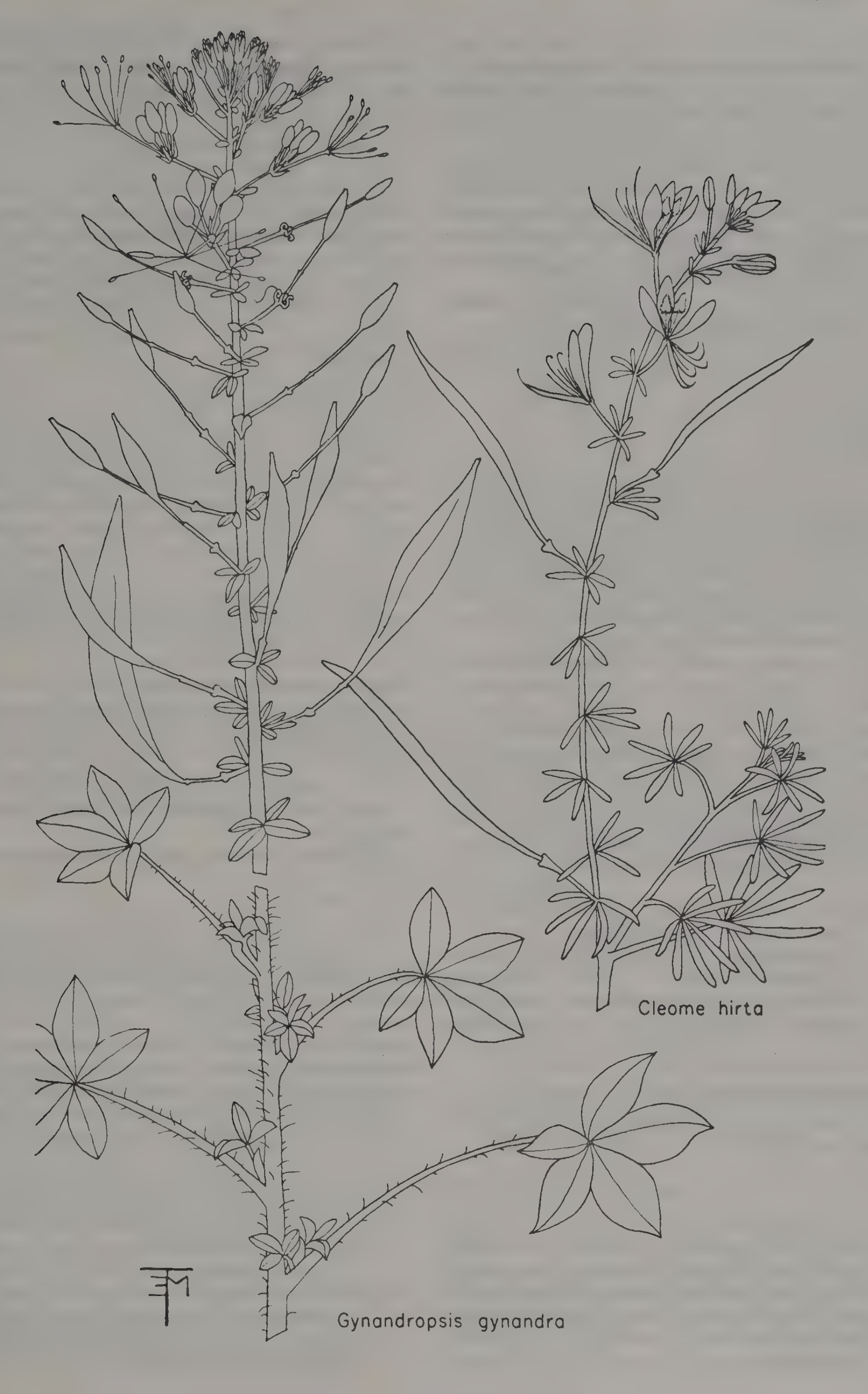
14. CRUCIFERAE†

Herbs or occasionally shrubs with alternate, exstipulate leaves and racemose inflorescences usually without bracts; sepals and petals 4; stamens 6, the two outer shorter than the 4 inner; ovary 2-locular, each loculus with 2 parietal placentas, the septum between usually membranous; style 1, stigma 2-lobed or capitate; fruit usually a capsule, or not uncommonly indehiscent, but never fleshy; seeds 1-many, without endosperm.

A mainly Mediterranean family including many weeds which occasionally turn up in East Africa as rare casuals.

1 Fruit at least 3 times as long as broad — 2
 Fruit less than 3 times as long as broad — 13
2 Leaves simple, entire, not clasping the stem — 10. *Farsetia*
 Leaves not simple, entire — 3
3 Leaves all pinnate or trifoliolate — 11. *Cardamine*
 Leaves pinnatisect to dentate or, if lower leaves apparently pinnate then rachis winged and upper leaves simple — 4
4 Perennials, mostly alpines — 5
 Annuals, seldom alpines — 6
5 Trailing-stemmed plant with hairy leaves — 13. *Arabis alpina*
 Acaulescent plant with glabrous leaves — 16. *Oreophyton falcatum*
6 Sepals more than 4 mm long — 7
 Sepals less than 4 mm long — 8
7 Flowers yellow; fruit with dehiscing valves on the seed-containing portion — 1. *Brassica*
 Flowers white, red, or yellow; fruit without dehiscing valves on the seed-containing portion, either indehiscent or breaking into 1-seeded portions — 3. *Raphanus*
8 Valves of capsule with no midrib; seeds in 2 rows in each loculus — 14. *Rorippa*
 Valves of capsule with a midrib; seeds usually in one row — 9
9 Alpine plant to 10 cm tall; petals white — 17. *Arabidopsis thaliana*
 Lowland plant more than 10 cm tall; petals yellow — 10
10 Stem leaves clasping the stem — 11
 Stem leaves not clasping the stem — 12
11 Leaves simple — 13. *Arabis glabra*
 Leaves pinnatisect — 12. *Barbarea intermedia*
12 Valves of fruit 3-veined; fruit without a persistent style (beak) at apex — 15. *Sisymbrium*
 Valves of fruit 1-veined, the lateral veins obscure; fruit with a persistent style (beak) at apex — 2. *Erucastrum arabicum*
13 Small glabrous scapose alpine plant to 5 cm tall with entire, linear leaves — 9. *Subularia monticola*
 Larger plants with stem-leaves — 14
14 Fruit indehiscent, spherical — 4. *Crambe*
 Fruit dehiscent or indehiscent, not spherical — 15
15 Stem leaves clasping — 16
 Stem leaves not clasping — 18

† By A. D. Q. Agnew and Joyce Stewart.


Cleome hirta
Gynandropsis gynandra

16 Leaves usually pinnatifid; capsule heart-shaped, broadest at the top, unwinged — 8. *Capsella bursa-pastoris*
Leaves simple, dentate; capsule ellipsoid, broadest in the middle, winged — 17
17 Capsule with septum across the broadest part — 18. *Camelina alyssum*
Capsule with the septum across the narrowest part — 7. *Thlaspi alliaceum*
18 Fruit of 2 globose lobes, hard, indehiscent and pitted; prostrate herb — 6. *Coronopus didymus*
Fruit flat, unlobed, dehiscent; erect herbs — 5. *Lepidium*

1. BRASSICA *L.*

Mostly annual herbs with erect, often branched stems, glabrous or with simple hairs; leaves often thick and glaucous; racemes bracteate; sepals erect, saccate; petals clawed, usually yellow; stamens 6, without appendages; ovary with a capitate or slightly 2-lobed stigma, the loculi continuing up into the style, forming a beak with 1–3 ovules; fruit a linear cylindrical capsule, the valves each with 1 prominent vein; seeds in 1 row.

An important genus of food plants including mustard, cabbage, turnip, etc., from which crops occasional individuals may escape and become adventive for a year or two. For this reason a key is given below, but a detailed description is made of only one, commonly weedy species, *B. rapa* L.

1 Upper leaves petiolate — 1. *B. integrifolia*
Upper leaves sessile and clasping the stem — 2
2 All leaves glabrous; stamens erect — 2. *B. oleracea*
Lowest leaves always ± bristly; filaments of outer stamens curved at base — 3
3 All leaves glaucous; buds held slightly higher than open flowers — 3. *B. napus*
Lowest leaves grass-green; open flowers held higher than buds — 4. *B. rapa*

1. Brassica integrifolia (*West*) *Ruprecht*

Found once in imported wheat seed. NBI.
Nattrass 1024.

2. Brassica oleracea *L.*

Abundantly cultivated and variable (as cabbage, kale, cauliflower, broccoli, brussels sprouts) this species has a long inflorescence with open flowers a long way below the buds. It has been found as an escape at NBI.
Nattrass 321.

3. Brassica napus *L.*

Not infrequently cultivated as swede, and as rape for the oily seeds. It has been found naturalized occasionally. HA.
van Someren s.n.

4. Brassica rapa *L.* (*B. campestris* L. of Check List)

Erect annual or biennial herb with swollen or thickened tap root and pinnatifid leaves with a large ovate terminal lobe; flowers bright yellow. Widely cultivated as turnip and for the oily seeds, and frequently found escaped. HM, HA, KIT, RV, NBI.
Bogdan 5576.

2. ERUCASTRUM (*DC.*) *Presl.*

Annual to perennial herbs with numerous simple hairs; leaves pinnatifid, not clasping the stem at base; sepals sometimes saccate; petals with limb and claw, yellow; stamens 6, without appendages; stigma simple or obscurely lobed; fruit a linear capsule, ± quadrangular in cross section, with keeled valves each with only one prominent dorsal vein, the beak of the fruit conical, with or (as in ours) without seeds; seeds ovoid or ellipsoid, ± one row in each loculus.

Erucastrum arabicum *Fisch. & Mey.*

An erect pubescent annual with oblanceolate pinnatifid leaves; petals yellow, rarely white with purple veins.

The commonest weedy Crucifer in Kenya, possibly introduced. HE, HT, HM, HA, HK, KIS, RV, NBI.
Wilkinson H41/40; Agnew and Azavedo 9317.

3. RAPHANUS *L.*

Annual to perennial herbs with simple stiff hairs and pinnatifid leaves; racemes bracteate; sepals erect, saccate; petals long-clawed, with a spreading limb, variable in colour; stamens 6, without appendages; ovary with a capitate or ± 2-lobed stigma; fruit elongated, jointed, the lowest portion corresponding to the valves of a 'normal' cruciferous fruit, seedless, resembling a stalk, while the upper portion (style or beak of other genera) contains a single row of seeds, without a septum.

1 Fruit very constricted between seeds and readily breaking up into 1-seeded portions, deeply ridged, the apical seedless portion more than twice the length of the last seeded portion — 1. *R. raphanistrum*
Fruit not very constricted between seeds, indehiscent, shallowly ridged, the apical seedless portion up to twice the length of the last seeded portion — 2. *R. sativus*

1. Raphanus raphanistrum *L.*

An erect annual with unswollen tap-root; leaves pinnatifid with the terminal lobe the largest; petals yellow, mauve, or white, often dark-veined; fruit ridged, constricted and dehiscent between the seeds, with a beak up to 4 times as long as the distance between constrictions.

An uncommon weed, probably not persistent, introduced from Southern Europe. HT, HM, HA, KIT, RV.

van Someren 549.

2. Raphanus sativus *L.*

Similar to the last species except for the swollen tap-root, the petals which are never yellow, and the fruit which is hardly constricted between seeds, almost smooth and shiny and indehiscent, with a shorter apical beak.

This is the common radish which occasionally escapes from cultivation. HA, RV.

Greenway 9735.

4. CRAMBE *L.*

Herbs with simple, often stiff hairs and entire or pinnatifid leaves; inflorescences usually much-branched, ebracteate; sepals spreading, hardly saccate; petals white, hardly clawed; stamens 6, the inner with toothed appendages; ovary with a capitate, sessile stigma; fruit indehiscent, 2-jointed, the lower one slender, stalk-like, seedless, the upper sphirical, 1-seeded.

1 Sepals over 1·9 mm long; fruits smooth — 1. *C. hispanica*
  Sepals under 1·5 mm long; fruits wrinkled or pitted — 2. *C. abyssinica*

1. Crambe hispanica *L.*

An erect rough-hairy annual or biennial with pinnatisect leaves; petals white; fruits globose, smooth.

Apparently indigenous, though also found in Europe, this plant can be found in highland grassland from 6000–9000 ft. It is abundant along pathsides in the Ngong Hills. HA, KIT.

Lind and Agnew 5023; Gillett 16143.

2. Crambe abyssinica *R. E. Fries*

Similar to *C. hispanica* except for the smaller flowers, shorter fruiting pedicel, and regularly pitted-reticulate fruit surface.

This species is often found as a weed of cultivated and disturbed ground in grasslands from 5000–8000 ft. HM, HA, RV, KAJ.

Glover 3582; Agnew and Azavedo 9307.

5. LEPIDIUM *L.*

Herbs with simple hairs and often divided leaves; flowers in dense ebracteate racemes; sepals non-saccate; petals small, often shorter than the sepals or absent, whitish; stamens 6 or reduced in number, without appendages; ovary with 2 ovules, short style, and capitate stigma; fruit short, flat, usually winged, often retuse above or below, 2-seeded, with the septum across the narrowest part.

1 All leaves simple and entire or only the upper ones toothed — 1. *L. africanum*
  All the leaves, or at least the lower ones, pinnatifid — 2
2 Plant glaucous and glabrous; fruits 5–6 mm long — 2. *L. sativum*
  Plant minutely hairy; fruits 2·5–4 mm long — 3. *L. bonariense*

1. Lepidium africanum (*Burm. f.*) DC.

Perennial pubescent herb with narrow-oblanceolate to linear leaves and green flowers; capsule hardly winged, hardly retuse at apex so that the style protrudes shortly.

An uncommon indigenous plant, probably often overlooked, growing in grassland at medium altitudes. HA, NAR, NAN.

Napier 1525.

2. Lepidium sativum *L.*

A glabrous annual, with pinnatisect or simply pinnate leaves and white petals; capsule winged, retuse at apex without a projecting style.

An introduced plant from Southern Europe, often cultivated for green salad, and recorded as occurring as a weed in KIT and NBI.

Nattrass 201.

3. Lepidium bonariense *L.*

An erect, softly pubescent annual with twice pinnatisect or pinnate leaves and small greenish flowers; capsule winged, retuse at apex with the style shorter than the sinus.

A pernicious annual weed in lawns in highly populated areas of Kenya, introduced from South America. HT, HA, HK, NBI.

Verdcourt 2767; Harmsen 6546.

6. CORONOPUS *Boehm.*

Herbs with pinnatifid leaves and leaf-opposed ebracteate racemes; flowers small; sepals not saccate; petals whitish, sometimes absent; stamens 6 or fewer by reduction; ovary with 1 ovule in each loculus and a ± 2-lobed stigma; fruit short, wide, with the septum across the narrowest part, indehiscent, splitting into 1-seeded halves.

Coronopus didymus (*L.*) *Sm.*

A sparsely tomentose to pubescent annual with deeply pinnatisect leaves and small green flowers; stamens usually 2; fruit valves hard, spherical, pitted.

An introduced weed of arable farm land, found particularly along paths and around farm buildings. HT, HM, HA, NAR, RV, NBI.

Bogdan 5627; Agnew 9659.

7. THLASPI *L.*

Herbs, usually glabrous, with simple leaves, often clasping the stem; racemes without bracts; sepals not saccate; petals clawed, white to pink; stamens 6, without appendages; ovary with few ovules and a capitate stigma; fruit a short capsule, flattened, with the septum across the narrowest part, the valves keeled and often winged; seeds usually more than one in each cell.

Thlaspi alliaceum *L.*

A glabrous, unbranched annual with oblanceolate, often dentate leaves; petals white.

A rare species so far only found in the bamboo-forest on Mt. Kenya. HK.

Bally 3275; Strid 4668.

8. CAPSELLA *Medic.*

Annual (or biennial) herbs with simple and branched hairs and cauline leaves clasping the stem at base; sepals not saccate; petals white, clawed; stamens 6, without appendages; ovary with a short style, capitate stigma, and many ovules; fruit obcordate (to ovoid), flat, with the septum across the narrowest part and keeled valves.

Capsella bursa-pastoris (*L.*) *Medic.*

A glabrescent annual with a basal rosette of pinnatifid to oblanceolate leaves; petals white.

An introduced weed (from Europe) in the higher arable land of Kenya. HT, HM, HA, NBI.

Tweedie 66/290; Greenway 10206.

9. SUBULARIA *L.*

Small glabrous aquatic herbs, with leaves all in a basal rosette, linear; racemes ebracteate, scapose, few-flowered; sepals not saccate; petals white, often absent; stamens 6, without appendages; ovary a little sunk in the receptacle, its base surrounded by a fleshy ring, with a sessile, capitate stigma; fruit with few ovules, a short capsule with the septum across the widest portion and 1-veined valves.

Subularia monticola *Schweinf.*

A tufted herb of uncertain life span, with linear leaves and white flowers, often forming mats in water.

An alpine plant, growing above 10 000 ft in the water at stream edges, in permanent pools, and on lake edges. HE, HA, HK.

Hanid 96; Coe and Kirrika 283.

10. FARSETIA *Desv.*

Tough annuals or shrubby perennials with simple sessile leaves, most parts covered with medifixed white hairs; racemes ebracteate; sepals hardly saccate, caducous; petals exceeding the sepals, clawed, yellow to purple; stamens 6, sagittate at base, without appendages; ovary with many ovules and a capitate or 2-lobed stigma, the lobes often decurrent on the style; fruit a long capsule, flattened, with the septum along the long axis, with the valves 1-nerved and a persistent stigma; seeds flat, winged.

1 Annual herb with a straight pod; petals often acute — 1. *F. stenoptera*
  Perennial shrub with a very undulate pod; petals rounded at apex — 2. *F.* sp. *A*

1. **Farsetia stenoptera** *Hochst.*

An erect annual covered with white medifixed hairs, with linear to narrow-lanceolate leaves; petals twisting when not turgid, yellow or livid to red.

A common crucifer of dry country, and rather variable. The flowers open at night and thus are seldom observed to best advantage in sunlight, rather like *Silene burchellii.* RV, BAR, NAN, MAG, MAC, KAJ.

Bogdan 4888; Agnew 7297.

2. **Farsetia** *sp.* **A.**

An erect, loosely branched shrub with a ± dense covering of appressed medifixed hairs; leaves narrow-lanceolate, petals pink or purple with darker nerves.

Common in one part of the Rift Valley, on screes and cliffs. RV.

Glover 4522; Agnew and Azavedo 9300.

11. CARDAMINE *L.*

Annual or perennial herbs with pinnate leaves and simple hairs; sepals not saccate; petals white, pink, or purple, never yellow; stamens 4–6, without appendages; stigma entire or obscurely 2-lobed; fruit a long capsule with obscurely veined valves and seeds in one row in each loculus.

1 Leaves 3-foliolate — 1. *C. africana*
  Leaves pinnate — 2
2 Creeping plant rooting at nodes; petals more than 5 mm long — 3. *C. obliqua*
  Annual erect plant; petals less than 3 mm long — 3

3 Fruits less than 1 mm broad, erect on a spreading pedicel, not crowded — 2. *C. hirsuta*
Fruits 1–1·5 mm broad, held on straight pedicels, crowded at tip of inflorescence — 4. *C. trichocarpa*

1. Cardamine africana *L.* (see p. 98)

A pubescent rhizomatous perennial herb, with trifoliolate leaves and ovate leaflets, petals white.

A widely distributed but never abundant plant of highland forests, 8000–10 000 ft, growing on the forest floor with other herbs and often found in bamboo with *Sanicula elata.* HE, HM, HA, HK, KAJ.

Agnew 7698; Bally 1190.

2. Cardamine hirsuta *L.*

Pubescent annual with pinnate leaves and 3–7 pairs of orbicular to linear leaflets; petals white or absent.

A rare annual in disturbed soil in open places at the upper forest levels and lower alpine zones on the mountains of East Africa. The same species is a common weed in Europe. HE, HA, HK.

Agnew 7182; Bogdan 4756.

3. Cardamine obliqua *A. Rich.*

A glabrescent perennial rhizomatous herb, often also creeping, with leaves bearing 5–9 oblanceolate to orbicular leaflets; petals white or pink, with red veins.

A common plant of streamsides in the alpine and highland forest zones, 7000–12 500 ft. HE, HM, HA, HK.

Strid 3119; Burrows in EAH 10039.

4. Cardamine trichocarpa *Hochst.* (see p. 98)

A pubescent annual with leaves bearing usually 9 ovate leaflets; petals white, shorter than the sepals.

An uncommon plant of western Kenya, growing in waste places in forest. HE, KIT.

Greenway 12125 (not from our area).

12. BARBAREA *R. Br.*

Herbs with erect stems, glabrous or with sparse simple hairs and with amplexicaul stem leaves; racemes ebracteate; sepals ± saccate; petals clawed, yellow; stamens 6, without appendages; ovary with many ovules, long style and obscurely 2-lobed stigma; capsule long, 4-angled, the valves with strong midrib; seeds in one row in each loculus, unwinged.

Barbarea intermedia *Bor.*

An erect glabrous perennial herb with a rosette of pinnatisect leaves; petals yellow.

A rare plant which has been found on the East African mountains at the lower edge of the alpine zone. HE, HA.

Dale 13275.

13. ARABIS *L.*

Annual to perennial herbs with simple and branched hairs and sessile leaves; sepals often saccate at base; petals with claw and limb; stamens 6, without appendages; ovary with short style and entire stigma; fruit a compressed capsule with a central indistinct midrib on each valve as well as a lateral network of veins; seeds many, 1 or 2 rows in each loculus.

1 Creeping perennial; flowers white; fruits spreading — 1. *A. alpina*
Erect biennial; flowers yellow; fruits erect — 2. *A. glabra*

1. Arabis alpina *L.*

Perennial, stellate-pubescent stoloniferous herb with obovate to oblong leaves.

A common alpine plant, growing above 10 000 ft altitude, often along streambanks and on cliffs. HE, HA, HK.

Hanid 122; Newbould 6092.

2. Arabis glabra (*L.*) *Bernn.* (*Turritis glabra* L.)

An annual (in our area), pubescent with simple or forked hairs, with basal obovate leaves in a rosette, (dead at flowering time).

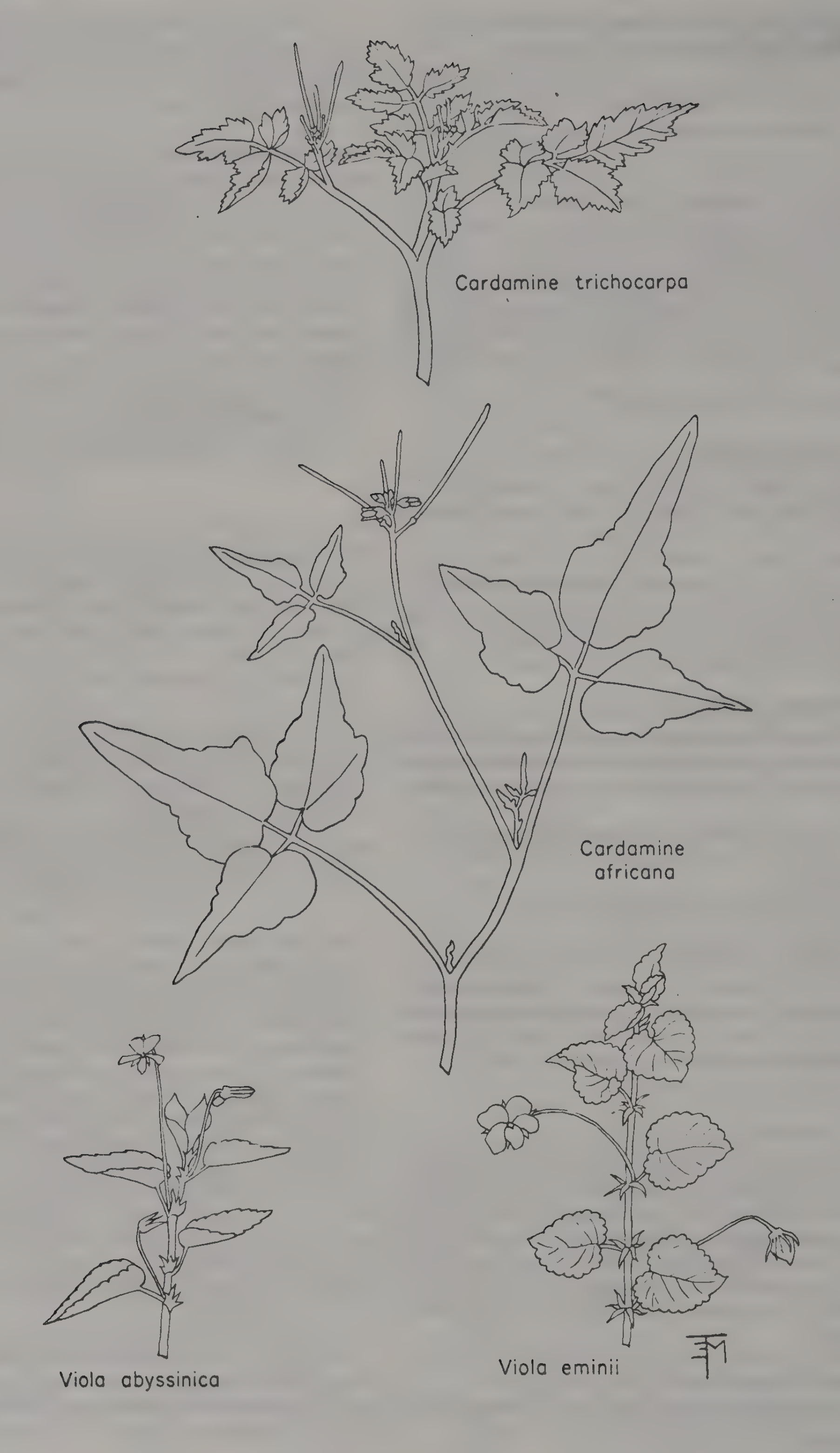
A locally abundant plant of highland grassland, often on shallow, disturbed soil. HM, HA, HK.

Agnew 7663; Verdcourt 3206.

14. RORIPPA *Scop.*

Herbs, with simple hairs or glabrous, with pinnatisect to pinnate leaves; racemes bracteate or not; sepals saccate; petals clawed, yellow, or white; stamens 6, without appendages; ovary with many ovules, a style variable in length, and an entire capitate stigma; fruit a long capsule, the valves reticulately veined but with no midrib; seeds usually in 2 rows in each loculus.

1 Leaves pinnate; flowers white — 1. *R. nasturtium-aquaticum*
Leaves pinnatisect or almost simple; flowers yellow — 2
2 Flowers solitary axillary (or racemes bracteate) — 4. *R. cryptantha*
Flowers in ebracteate racemes — 3
3 Petals 3–6 mm long; fruiting pedicels over 5 mm long — 3. *R. nudiuscula*
Petals 1·5–2 mm long; fruiting pedicels less than 4 mm long — 2. *R. madagascariensis*


Cardamine trichocarpa
Cardamine africana
Viola abyssinica
Viola eminii

1. Rorippa nasturtium-aquaticum (*L.*) *Hayek* (*Nasturtium officinale* R. Br.)

A glabrescent trailing perennial herb, rooting at the nodes, with pinnate leaves bearing oblong-elliptic to suborbicular leaflets; flowers white.

Commonly grown for watercress (a green salad) and cosmopolitan in cooler streams. This plant is found in streamsides, often where disturbed by man's activities, and seldom in forest. HA, NBI.

Bally 8653; Hanid 16.

2. Rorippa madagascariensis (*DC.*) *Hara*

An annual, glabrous or pubescent, with pinnatisect leaves bearing oblong, often pinnatifid leaflets; petals yellow.

An uncommon plant of watersides in dry country. MAC.

Agnew 7507; Verdcourt 847.

3. Rorippa nudiuscula (*Sond.*) *Thell.*

A glabrescent perennial herb with spathulate, dentate, (sometimes lobed) leaves; petals yellow.

A rare plant only collected three times in Kenya and generally rather little known. HT, RV.

Harvey 5009.

4. Rorippa cryptantha (*A. Rich.*) *Robyns & Boutique*

A glabrescent annual, with twice pinnatisect leaves, the ultimate segments ± oblong; flowers solitary, yellow.

A rare plant found only once in Kenya, by Thomson's Falls, growing along the stream banks. HA.

Bogdan 4757.

15. SISYMBRIUM *L.*

Annual to perennial herbs with simple hairs and usually pinnatifid leaves; racemes with or (usually) without bracts; sepals not saccate; petals clawed, yellow or white; stamens 6, without appendages, stigma not 2-lobed; fruit a long capsule, the valves with a strong midrib and 2 weak lateral veins, and with the persistent stigma short or absent.

1 Fruit long-conical, narrowing to a point, appressed to the stem 1. *S. officinale*
Fruit long-cylindrical, parallel-sided, spreading 2. *S. erysimoides*

1. Sisymbrium officinale (*L.*) *Scop.*

An erect annual with pinnatifid leaves; petals yellow.

An introduced weed, possibly not maintaining itself. RV.

van Someren, December 1958.

2. Sisymbrium erysimoides *Desf.*

A sparsely pubescent annual with pinnatifid leaves; petals pale yellow.

A rare, introduced alien, from the Mediterranean region. RV.

Meinertzhagen 9309.

16. OREOPHYTON *O. E. Schulz*

A genus similar in all respects to *Rorippa*, except for the habit which is acaulescent and the embryo characters which are said to be different.

Oreophyton falcatum (*A. Rich.*) *O. E. Schulz*

A glabrous perennial herb with a rosette of pinnatisect leaves; flowers white in short racemes.

An alpine plant growing usually near streams from 11 500–14 500 ft. HE, HA, HK.

Hedberg 1702; Hanid 183.

17. ARABIDOPSIS *Heynh.*

Annual or perennial herbs with both simple and forked hairs; inflorescence corymbose; inner sepals not saccate; stamens 6, without appendages; style short, stigma entire or obscurely 2-lobed; fruit a many-ovuled capsule having 1-veined valves with prominent midribs and seeds in 1 row.

Arabidopsis thaliana (*L.*) *Heynh.*

A small annual rosette with elliptical or spathulate leaves; petals white.

A plant indigenous to the East African mountains but also found in Europe and Asia to Japan. HE, HM, HK.

Hanid, Agnew and Mendes 131; Hedberg 1814.

18. CAMELINA *Crantz*

Annual herbs with simple and forked hairs and erect stems with simple, amplexicaul, sessile leaves; raceme ebracteate; sepals not saccate; petals clawed, yellow or white; stamens 6, without appendages; ovary with many ovules, and a capitate stigma on a distinct style; fruit a capsule, short and broad, with convex, keeled, winged valves, each with a strong midrib which disappears above; septum across the broadest part; seeds in 2 rows in each loculus.

Camelina alyssum (*Mill.*) *Thell.*

An annual with coarsely dentate to pinnatifid leaves; petals white.

A weed of flax throughout the world which has been found only twice in Kenya, both times in KIT.

Dowson 698.

15. VIOLACEAE†

Herbs, shrubs, or trees, with alternate, or rarely opposite, stipulate simple leaves; flowers regular or zygomorphic, bisexual, solitary or in racemes; sepals 5, free; petals 5, free, the anterior one with a spur projecting between the adjacent sepals; stamens 5, all similar, or the anterior pair with appendages projecting into the spur; filaments free or united; ovary superior, sessile, unilocular usually with 3 parietal placentas and many ovules, with simple style and undivided stigma; fruit a capsule; seeds with endosperm, sometimes arillate.

1 Anterior petal with a long stalk; stipules entire 1. *Hybanthus enneaspermus*
Anterior petal sessile; stipules dentate or laciniate 2. *Viola*

1. HYBANTHUS *Jacq.*

Herbs or shrubs with alternate or opposite, entire or serrate leaves; flowers solitary or rarely in racemes, zygomorphic; petals unequal, the anterior one either smaller than the others or, as in ours, much larger, and narrowly stalked, with a basal spur; 2 anterior stamens with spur appendages; ovary with 3 placentas, with few to many ovules; fruit a loculicidal capsule; seeds large and characteristically ornamented, with a small aril.

Hybanthus enneaspermus (*L.*) *F. Muell.*

A very variable hairy herb or shrub, with linear-lanceolate entire to ovate-elliptic serrate leaves and red or pink spurred flowers; seeds longitudinally ribbed and pitted, glabrous.

An extremely variable species, but usually found as a linear-leaved, strigose-hairy annual to 25 cm with pink flowers, in disturbed dry or subdesert bush. It is not very common. MUM, MAG, NBI, KAJ.

Isaac, December 1961; Verdcourt 2669.

2. VIOLA *L.*

Herbs (in ours) or shrubs, with alternate, usually serrate, leaves, flowers solitary, zygomorphic; sepals equal, sometimes with a basal appendage; petals unequal, the anterior spurred at base, the posterior ones erect; anterior filaments produced into the connective, and secreting nectar; ovary with 3 placentas and simple style and stigma; seeds usually smooth, with much endosperm, with or without an aril.

1 Leaves rounded at apex, glabrous or slightly hairy along midrib on upper surface 1. *V. eminii*
Leaves pointed at apex, hirsute between the veins on the upper surface 2. *V. abyssinica*

1. Viola eminii (*Engl.*) *R. E. Fries* (*V. duriprati* R. E. Fr. in Check List) (see p. 98)

Creeping, hairy, perennial herb with subcordate leaves and solitary blue to violet flowers.

A common violet, creeping often amongst rocks or on peaty soil at altitudes above 8000 ft, in the open or along forest paths and streamsides. HE, HC, HA, HK.

Agnew 8679; Glover 1099.

2. Viola abyssinica *Oliv.* (see p. 98)

Similar to *V. eminii* except for the leaves which are pointed and hairy above and sepals which are hardly appendiculate.

Found at lower altitudes (6000–9500 ft) than *V. eminii*; this species is also more rampant, and often has erect flowering stems. HE, HC, HM, HA, HK.

Agnew 8681; Kerfoot 2856.

16. RESEDACEAE‡

Usually herbs, rarely shrubs; leaves alternate, simple or divided, stipulate; inflorescence racemose, terminal; flowers bisexual (rarely unisexual) usually zygomorphic; sepals 4–6, usually 5, free; petals 4–7, usually 4–5, free, often divided or fringed; nectary disc often present, at least on one side; stamens definite to indefinite, often 10–15; anthers splitting longitudinally, introrse, 2-celled; ovary superior, of 2–6 (usually 5) free or slightly connate carpels, which often never completely close (thus the ovules resemble those of gymnosperms, but the pollen tube grows through the carpel wall in the normal angiosperm way); fruit a capsule or of follicles; seeds without endosperm.

1. CAYLUSEA *St.-Hill.*

Annual or short-lived perennial herbs with entire, often undulate, leaves; flowers bisexual, in dense bracteate racemes; sepals 5; petals 5, simple or digitate, with a short ligule between the spreading limb and dilated base; stamens 10–15; ovary of 5–6 whorled open carpels lightly connate at the base; fruit of open follicles with few seeds.

Caylusea abyssinica (*Fresen.*) *Fisch. & Mey.*

Annual or short-lived perennial herb, with linear-lanceolate, often undulate leaves and long racemes of whitish flowers.

† By A. D. Q. Agnew.

‡ By A. D. Q. Agnew.

A common weed of disturbed places in grassland, but not found in the driest or highest situations. It is allied to the European mignonette which it resembles. HT, HM, HA, HN, KIT, NAR, BAR, EMB, NBI, KAJ.

Strid 2724; Verdcourt 552.

17. POLYGALACEAE†

Herbs or woody trees, shrubs and climbers; leaves alternate, simple, entire, exstipulate; flowers zygomorphic, bisexual, usually in racemes; sepals 5, the two posterior laterals often enlarged and petaloid; petals 3–5, free or connate, the lower petal often forming an appendaged keel; stamens 5–8, with filaments united in a slit tube, rather similar to those of the Papilionaceae, anthers dehiscing by apical pores; ovary of 2 carpels, with one pendulous axile ovule in each; seeds usually arillate (the aril called a caruncle), endospermic.

1 Herbs, rarely shrubby at base; fruit a dry capsule — 1. *Polygala*
Trees, shrubs or woody climbers; fruit not a dry capsule — 2
2 Petals 5; stamens 5; fruit a drupe — 2. *Carpolobia*
Petals 3; stamens 8; fruit winged, indehiscent — 3. *Securidaca*

1. POLYGALA *L.*

Low shrubs or herbs; leaves and flowers as in the family; sepals 5, the two anterior fused or free, the two laterals enlarged and petaloid and termed *wings*; petals 3 or 5, the lowest forming a keel, often appendaged with a *crest* of filament-like threads, the lateral obscure or absent, the two posterior often as long as the keel and joined to it; stamens 8, or 6 + 2 sterile, the filaments fused in a tube around the ovary; fruit a flattened capsule, with 2 silky axile seeds, each with an aril, or *caruncle*, which may have papery appendages.

1 Anterior sepals (those next to the keel) fused — 2
Anterior sepals free — 3
2 Leaves rounded or obtuse, mucronate at tip; keel of flower with a tufted appendage — 1. *P. amboniensis*
Leaves with acute, needle-like tip; keel with no appendage — 2. *P. petitiana*
3 Inflorescences terminal and axillary — 4
Inflorescences axillary only — 10
4 Usually annuals; racemes or raceme of clusters each with more than 20 flowers — 5
Perennials; racemes with less than 20 flowers — 10
5 Racemes exceeding the plant's leaves — 6
Racemes overtopped by leaves — 8
6 Wings less than 2·0 mm wide — 3. *P. myriantha*
Wings more than 3·0 mm wide — 7
7 Stems and leaves pubescent or glabrous; pedicels and wings pubescent; wings with 5–7 nerves — 4. *P. ukirensis*
Stems and leaves with scattered hairs or glabrous; pedicels and wings glabrous; wings with 3 major nerves — 5. *P. abyssinica*
8 Racemes dense, spherical or shortly cylindrical — 6. *P. arenaria*
Racemes or raceme of clusters elongate or long-cylindrical — 9
9 Wings orbicular, glabrous — 7. *P. persicariifolia*
Wings elliptic, hairy at base — 8. *P. albida*
10 Rachis of raceme longer than its subtending leaf — 11
Rachis of racemes equal to or shorter than its subtending leaf — 12
11 Wings orbicular — 9. *P. sphenoptera*
Wings elliptical — 10. *P. ohlendorfiana*
12 Annual herb; wings with green midrib up to 2·5 mm broad — 11. *P. erioptera*
Perennial herbs; wings without green midrib, more than 3 mm broad — 13
13 Wings orbicular or triangular, more than 7·5 mm broad — 12. *P. senensis*
Wings elliptic, less than 5 mm broad — 13. *P. sadebeckiana*

1. Polygala amboniensis *Gürke*

Glabrescent annual or short-lived perennial herb, with oblong-linear leaves and green and pink or purple flowers.

A common *Polygala* of drier bushland in Kenya, extending to the coast. The flowers are not very colourful. RV, MAG, MAC.

Isaac, December 1961; Verdcourt and Napper 2168.

2. Polygala petitiana *A. Rich.* (see p. 102)

Glabrous or glabrescent annual with linear to narrow-elliptic leaves and elongated racemes of yellowish-green to dull-purple flowers.

The most easy to recognize of the annual, erect *Polygalas.* It grows in grassland, often on shallow soil, but not in the dry bush area or the highland forest zone. HE, HC, HT, KIT, MUM, KIS, MAC, NBI.

Tweedie 66/222; Symes 158.

3. Polygala myriantha *Chod.*

Puberulent, branched annual with elliptic to linear leaves and dense racemes of mauve or lilac flowers.

†By A. D. Q. Agnew.

are represented here. HM, HA, KIT, NAN, MAC, NBI.

Agnew 9149; Verdcourt 3171.

2. CARPOLOBIA and 3. SECURIDACA

Both these genera are dealt with in KTS., although *Securidaca welwitschii* Oliv. is a woody climber.

18. CRASSULACEAE†

Succulent, erect or creeping herbs and undershrubs; leaves opposite or alternate, exstipulate; flowers regular, bisexual, usually cymose; sepals free or united, often 4 or 5; petals as sepal number, free or united; stamens as many as or twice the number of petals; filaments free; ovary superior; carpels free, as many as petals, rarely loosely united in the middle, each with a nectary at the base; ovules few to many; fruit of membranous or leathery follicles, often surrounded by persistent membranous corolla; seeds minute, endospermous.

1 Leaves alternate above — 2
Leaves all opposite — 3
2 Leaves peltate; corolla tubular — 5. *Umbilicus botryoides*
Leaves simple; corolla lobes spreading — 4. *Sedum*
3 Corolla tubular, conspicuous, over 1 cm long; stamens 8–10 — 4
Corolla small, rotate, less than 1 cm long; stamens 5 — 2. *Crassula*
4 Flower parts in fives; flowers pendulous — 1. *Cotyledon barbeyi*
Flower parts in fours; flowers erect — 3. *Kalanchoe*

1. COTYLEDON *L.*

Herbs or shrubs with sessile opposite entire leaves and flowers in terminal corymbose cymes; calyx 5-lobed; corolla of 5 fused segments, forming a tube below with ± spreading lobes; stamens 10; follicles 5, free, many-seeded.

Cotyledon barbeyi *Schweinf.*

An erect, many-stemmed shrub with obovate to oblanceolate fleshy leaves; inflorescence glandular, of large pendulous red flowers.

Locally common and conspicuous in dry, stony bushland, especially on small hills. HM, NAR, NAN, RV, MAC, NBI, KAJ.

Strid 2808; Glover 3670.

2. CRASSULA *L.*

Fleshy herbs with opposite simple leaves and cymose inflorescences or solitary flowers; sepals 4–5 joined at base; petals 4–5, free; stamens 4–5 alternating with scales which are opposite the petals and carpels; follicles 4–5, 1–many-seeded.

1 Leaves in a basal rosette often dying when the plant flowers; inflorescence a terminal corymbose cyme or raceme of cymes — 2
No basal rosette of leaves present; flowers all axillary — 3
2 Flowers in a corymbose cyme — 1. *C. alba*
Flowers in a raceme of cymes — 2. *C. nodulosa*
3 Leaves petiolate, narrowed to the base — 4
Leaves sessile, not or hardly narrowed to the base — 5
4 Leaves round at apex; flowers white — 3. *C. volkensii*
Leaves acute at apex; flowers pink — 4. *C. alsinoides*
5 Flowers solitary, axillary; pedicels longer than calyx — 6
Flowers in crowded axillary cymes; pedicels shorter than calyx — 8
6 Plant of perennial streams and marshes which never dry up; leaves slightly wider in the middle than at base; seeds 1–4 in each follicle — 7
Plant of shallow temporary pools; leaves very narrow, parallel-sided; seeds more than 6 in each follicle — 5. *C.* sp. *A*
7 Plant of Mt. Elgon above 9000 ft; seeds 4 in each follicle — 6. *C.* sp. *B*
Plant of other mountains and lowlands; seeds 1–2 in each follicle — 7. *C. granvikii*
8 Plant annual; leaves never imbricate (overlapping one another) — 8. *C.* sp. *C*
Plant perennial; leaves imbricate on at least some shoots — 9. *C. pentandra*

1. Crassula alba *Forsk.* (see p. 108)

An erect, probably biennial herb with a rosette of lanceolate fleshy basal leaves and opposite, reduced stem leaves; corymb of small white flowers.

Locally common plant found in dry rocky grassland. HC, HM, HK, KIT, NAR, RV, MAC, KAJ.

Agnew 10735; Glover 4238.

2. Crassula nodulosa *Schonl.*

A perennial herb with ovate-lanceolate rosette leaves and a cylindrical raceme of small whitish flowers.

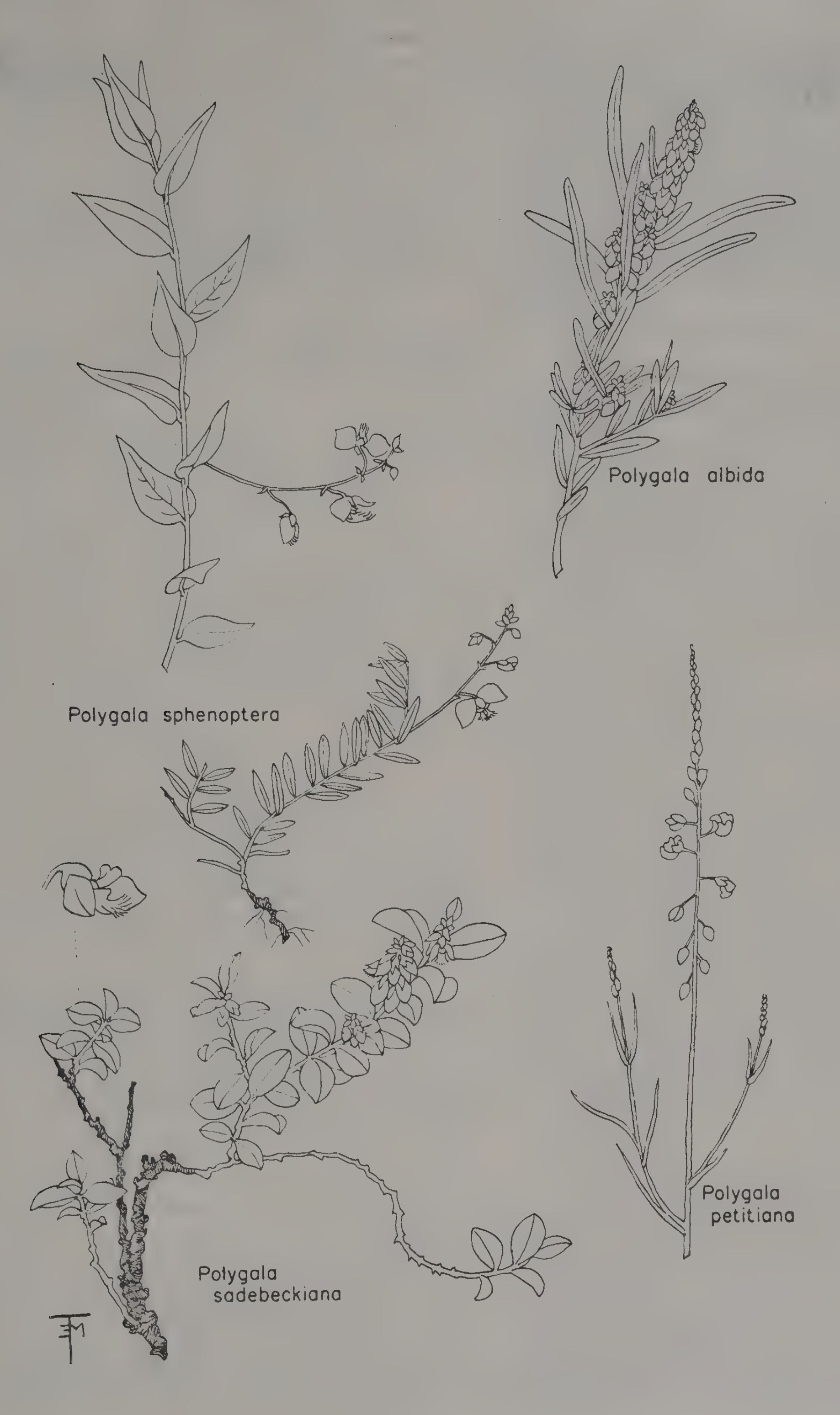
Rare plant found in dry, stony grassland. NAN.

Napper 1317.

3. Crassula volkensii *Engl.*

A glabrous or pubescent, loose perennial soft shrub or herb with spathulate to elliptic often-

† By A. D. Q. Agnew.


Polygala albida
Polygala sphenoptera
Polygala petitiana
Polygala sadebeckiana

Apparently rare, but may be overlooked. Only recorded from upland grassland on grey soil near Kipkarren. KIT.

Brodhurst-Hill 361; Tweedie 68/133.

4. Polygala ukirensis *Gürke*

Pubescent annual with linear leaves and loose racemes of blue and yellow flowers.

Local but relatively common in the grasslands of Trans-Nzoia and thereabouts. KIT, MUM.

Dale 3182; Tweedie 67/211.

5. Polygala abyssinica *R.Br.*

A glabrous or sparsely hairy annual with linear leaves and loose racemes of white or flushed purple flowers.

Locally common plant found in dry grassland at medium altitudes. HM, HA, RV, NAN, MAC, KAJ.

Agnew and Humphry 5563; Kerfoot 4742.

6. Polygala arenaria *Willd.*

A sympodially branched, tomentose annual with elliptic to oblanceolate leaves and dense globular racemes of pinkish or white/cream flowers.

A rather rare *Polygala*, found at the coast and west of the Rift Valley, often associated with disturbed ground and cultivation. HA, KIS.

Hanid 649; Lucas 218.

7. Polygala persicariifolia *DC.*

A puberulous annual with linear, elliptic-acuminate or oblong-acute leaves and short racemes of cream to pale purplish flowers.

An uncommon plant of steep rocky hillsides and disturbed soils in wet forest of Kakamega, Nandi, lower Elgon, and Cherangani. HC, MUM.

Makin 321.

8. Polygala albida *Schinz* (see p. 102)

An erect puberulous annual with linear to elliptic-oblong leaves and short racemes bearing crowded green or white flowers.

A fairly common *Polygala* often found as a weed of fields and roadsides. HC, KIT, MUM, KIS, BAR, KAJ.

Agnew 8628; Symes 216.

9. Polygala sphenoptera *Fresen.* (see p. 102)

Perennial or annual shrubby herb, suffruticose or trailing, with linear, oblong or elliptic leaves, sometimes with revolute margins (especially in dry land forms), and lateral, axillary or extra-axillary, short, loose racemes of purple or pinkish-white flowers.

An extremely variable species, which is our commonest *Polygala* in Kenya. It grows apparently in dry bushland, grassland and upland grassland as well as along paths and clearings in the wetter highland forests. Perhaps future observations will show us how to split up the forms into units which make sense ecologically, but to this author it seems as though there is a continuously intergrading series from Magadi to Cherangani. Dry grass and bushland forms have narrow, revolute-margined leaves; white forms from wetter areas have broad, elliptic, acuminate leaves and often a trailing habit. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, NAR, BAR, RV, MAG, NAN, MAC, NBI, KAJ.

Agnew 8432; Leippert 5234.

10. Polygala ohlendorfiana *Eckl. & Zeyh.*

Glabrous or puberulent perennial herb from a woody rootstock, with elliptic leaves and red or purple flowers crowded in the terminal or lateral racemes.

A little-known plant in Kenya represented by scattered specimens from various habitats, but I am not quite convinced that all belong to one species. More collections are required, particularly fruiting specimens from the Aberdares above 9000 ft. HA, KIT, NAR.

Glover 5258; Jex-Blake B1259; Agnew 8129.

11. Polygala erioptera *DC.*

Annual or short-lived pubescent perennial with linear-oblong leaves and axillary clusters of white or red flowers.

Fairly common in rocky areas of bare soil in the dry grasslands of Kenya, especially on shallow soils. HE, MUM, KIS, RV, MAG, MAC, NBI.

Agnew 8227; Gillett 17329.

12. Polygala senensis *Klotzsch*

Erect, pubescent, shrubby perennial with oblanceolate to oblong leaves and axillary racemes of 1–4 pink to purple flowers.

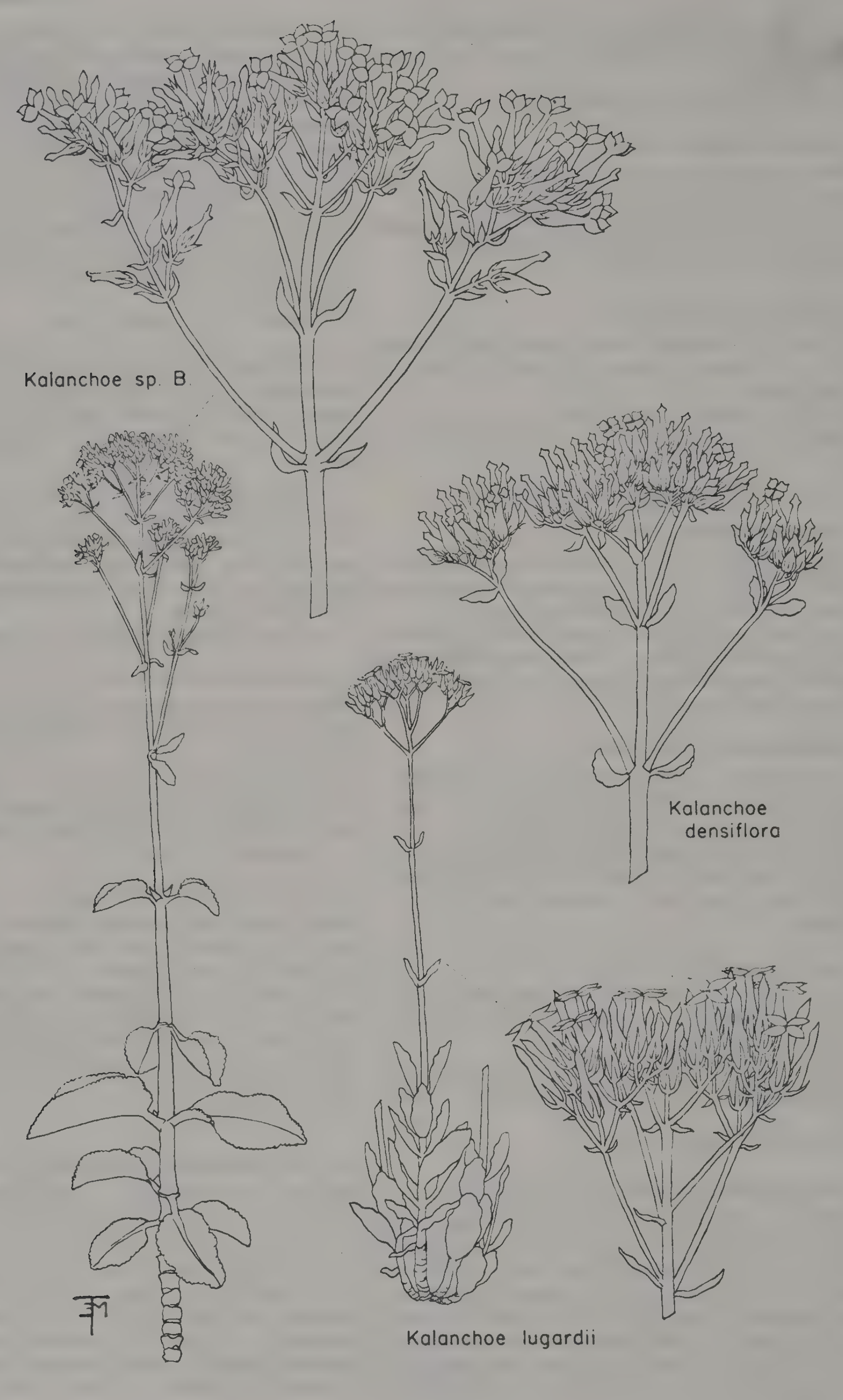
A plant of dry bushland. This name has been applied to our material in the absence of any other. The species appears to be clear cut, but it remains probable that this is not the correct name for it. NAN, MAG.

Greenway 9519.

13. Polygala sadebeckiana *Gürke* (see p. 102)

Perennial herb or shrub, erect or decumbent, with elliptic to oblong leaves and axillary racemes of 8–12 (rarely more) orange-yellow to red flowers.

This name is used here for an uncommon but widespread group of plants which includes erect or trailing, red-flowered plants of forest edges and grassland, as well as prostrate, orange-yellow-flowered plants of bare grassland. More collecting is needed to determine whether one or two species


Kalanchoe sp. B
Kalanchoe densiflora
Kalanchoe lugardii

marked leaves and solitary white flowers on long pedicels.

Locally common, found in stony bushland, but not in the driest country. NAR, RV, NAN, MAC.

Lind in UCNH 13; Glover 4365.

4. Crassula alsinoides (*Hook. f.*) *Engl.* (see p. 108)

A sprawling or prostrate herb, glabrous except for a line of hairs on the internodes, with elliptic, acute, unmarked leaves and solitary pink flowers.

Locally common plant found in wet, rocky places in the montane forest area. HE, HM, HA, HK, MAC.

Agnew and Faden 9980; Mwangangi 330.

5. Crassula *sp.* **A.**

A trailing herb, possibly annual, with ascending or erect stems bearing linear leaves and solitary pink to white flowers.

Locally common plant found in ephemeral pools around Nairobi. MAC, NBI.

Archer 317; Agnew and Hanid 7525.

6. Crassula *sp.* **B.**

A glabrous, perennial, soft herb, with a trailing base and tufted, erect stems bearing linear leaves; flowers pinkish; follicles 4-seeded.

Only known from marshes in the moorlands of Mt. Elgon. HE.

Verdcourt 2474; Lugard 330.

7. Crassula granvikii *Mildbr.* (see p. 108)

Similar to the last species except for the often obtuse leaves (in *sp.* B. acute) and seed number.

This species is widespread and variable. Alpine forms on the Aberdares and Mt. Kenya are exceedingly small and tend to have 2-seeded follicles, but lowland forms can be very robust and their follicles are mostly 1-seeded. HE, HC, HT, HM, HL, HA, HK, KIT, RV, NBI.

Coe and Kirrika 263; Bally 11477.

8. Crassula *sp.* **C.**

A small, glabrous, erect, usually unbranched annual with linear leaves and axillary clusters of minute reddish flowers.

Locally common plant found on shallow soils. HC, RV, MAC.

Agnew, Kibe, and Mathenge 10314; Kerfoot 3582.

9. Crassula pentandra (*Edgeworth*) *Schonl.*

A glabrous perennial softly woody herb, trailing at base and with erect stems and triangular-ovate or lanceolate leaves; flowers pinkish-white in dense axillary clusters.

Common in stony upland grassland. HE, HC, HM, HA, HK, NAR, RV, NAN, MAC, NBI.

Lind and Agnew 5747; Verdcourt 3803.

3. KALANCHOE *Adans.*

Fleshy herbs or soft shrubs with opposite, entire or divided leaves and flowers in terminal corymbose cymes; calyx of 4 lobes joined at least at base; corolla of 4 joined petals, with a cylindrical tube; stamens 8, fused to corolla tube; follicles 4, many-seeded; seeds longitudinally ridged.

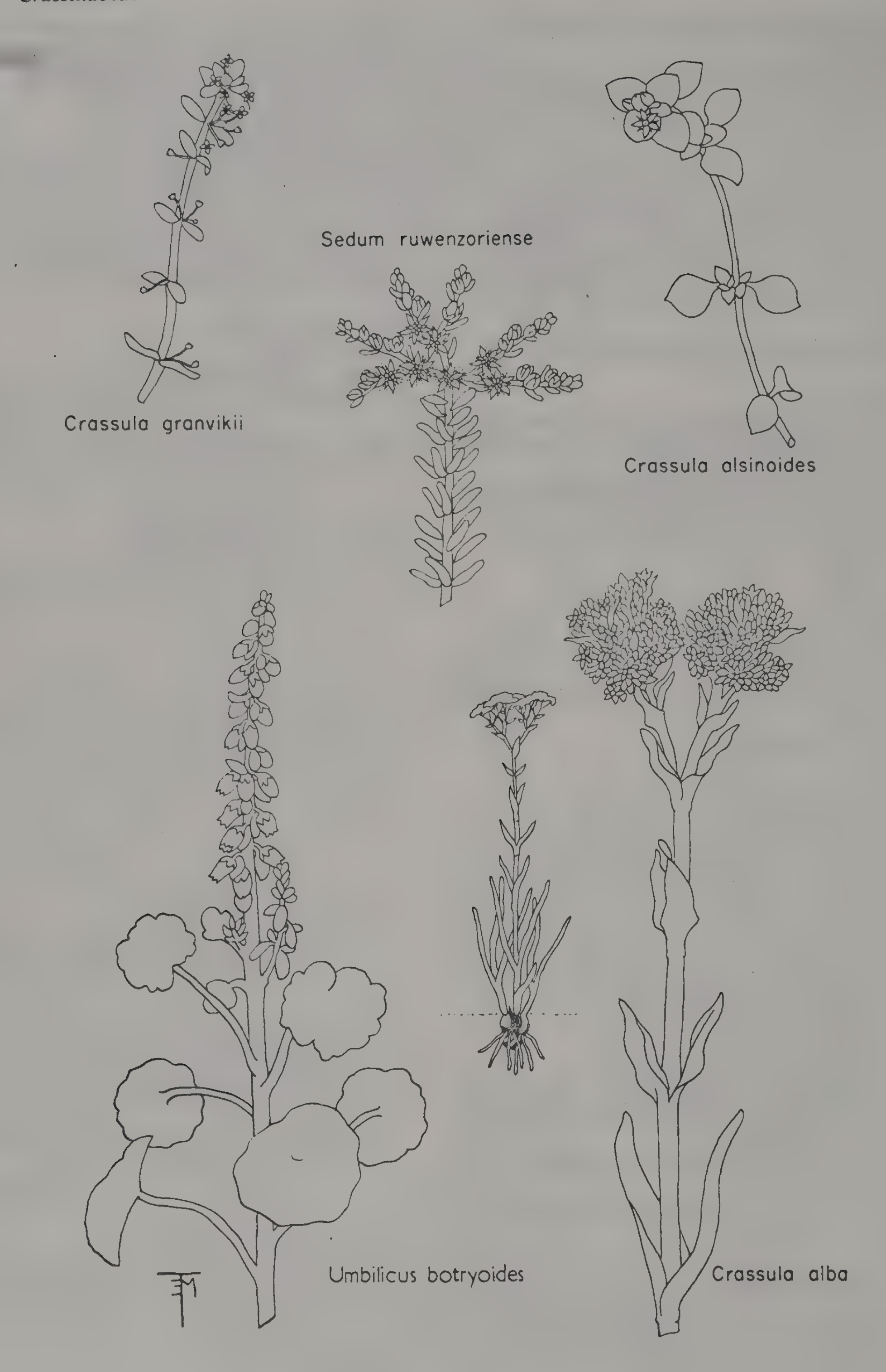
1 Leaves compound — 2
  Leaves simple — 3
2 Plant glabrous; calyx inflated with lobes shorter than the tube; flowers pendulous — 1. *K. pinnata*
  Plant glandular-hairy; calyx not inflated, the tube shorter than the lobes; flowers erect — 2. *K. rohlfsii*
3 Pedicels and calyx pubescent — 4
  Pedicels and calyx glabrous — 7
4 Plant glandular-hairy on the inflorescence — 5
  Plant densely pubescent only, without glands — 3. *K. citrina*
5 Leaves sessile; stem leaves oblong — 4. *K. lanceolata*
  Stem and basal leaves ovate, petiolate — 6
6 Sepals more than half as long as corolla tube; corolla lobes lanceolate, acute — 5. *K.* sp. *A*
  Sepals less than half as long as corolla tube; corolla lobes ovate-elliptic, obtuse mucronate — 6. *K.* sp. *B*
7 Leaves sessile; flowers white, over 5 cm long — 7. *K. marmorata*
  Leaves petiolate; flowers yellow or orange, less than 4 cm long — 8
8 Leaves auriculate, peltate at base; corolla over 2 cm long; anthers slightly exserted or visible in the mouth of the corolla tube — 8. *K. lugardii*
  Leaves simple at base; corolla less than 2 cm long; anthers included in the corolla tube — 9
9 Leaves cuneate at base, often spotted purple along the crenate margin; sepals fleshy, drying wrinkled — 9. *K. glaucescens*
  Leaves rounded at base, never purple-spotted; sepals thin, drying flat and papery — 10. *K. densiflora*

1. Kalanchoe pinnata (*Lam.*) *Pers.*

An erect, glabrous herb with pinnate leaves bearing elliptic leaflets and a diffuse inflorescence of large pendulous red flowers.

An introduced plant, escaped in parts of Nairobi. NBI.

Agnew 7617; Williams 716.


Sedum ruwenzoriense
Crassula granvikii
Crassula alsinoides
Umbilicus botryoides
Crassula alba

2. Kalanchoe rohlfsii *Engl.*

An erect, glandular-pubescent, weak perennial with ternate leaves bearing lanceolate to ovate leaflets and a dense terminal corymb of yellow flowers.

Locally common plant found in rocky grassland, especially in the Rift Valley. RV, MAC, KAJ.

Agnew 10614.

3. Kalanchoe citrina *Schweinf.*

An erect, pubescent, weak perennial with oblanceolate to ovate deeply dentate leaves and a small dense terminal corymb of yellow flowers.

Locally common plant found in dry, rocky bushland. BAR, MAC.

Tweedie 68/141.

4. Kalanchoe lanceolata (*Forsk.*) *Pers.*

An erect, glandular-pubescent annual with almost glabrous, obovate to oblong, entire or dentate leaves and a dense corymb of yellow to orange-red flowers.

Locally common plant found in dry country. HE, KIT, MUM, BAR, RV, MAG, MAC, NBI, KAJ.

Strid 2709; Kokwaro 282.

5. Kalanchoe *sp.* **A.**

An ascending, glandular-pubescent, weak perennial with obovate crenate leaves and rather small corymbs of red flowers.

In bushed grassland in western Kenya. KIT, MUM.

Agnew, Musumba, and Kiniaruh 8059.

6. Kalanchoe *sp.* **B.** (see p. 106)

An erect glandular-pubescent perennial with ovate to orbicular leaves and corymbs of orange-red flowers.

Uncommon plant found in bushed grassland. HE, KIT.

Agnew, Kibe, and Mathenge 10592.

7. Kalanchoe marmorata *Bak.*

An erect, glabrous, weak perennial with sessile, obovate, often purple-blotched leaves and a loose terminal corymb of large white flowers.

Apparently not wild in our area but cultivated and escaped in western Kenya and around Nairobi. MUM, NBI.

Mathenge 349.

8. Kalanchoe lugardii *Bullock* (see p. 106)

An erect, glabrous herb, perennating from innovation shoots on the rootstock, or annual; with ovate to orbicular, peltate or auriculate, often purple-blotched leaves, and a corymb of pale orange to yellow flowers.

Uncommon plant found in dry, rocky bushland. HE, HT, KIT, BAR, MAG, NAN, MAC, KAJ.

Lugard 115; Agnew 10690.

9. Kalanchoe glaucescens *Britten*

A glabrous perennial, trailing at the base and with erect stems, with obovate to ovate-elliptic, petiolate leaves and small terminal corymbs of orange-yellow to yellow flowers.

Locally common plant found in stony bushland. MUM, NAR, BAR, RV, MAC.

Glover and Samuel 3377; Ehnbom in Strid 2706.

10. Kalanchoe densiflora *Rolfe* (see p. 106)

An erect, glabrous herb, perennating from innovation shoots on the rootstock, with orbicular to ovate, crenate, petiolate leaves and a dense terminal corymb of yellow flowers.

This is our commonest species of *Kalanchoe*, growing in disturbed places, 6000–9000 ft. HE, HT, HM, HA, RV, EMB, MAC, NBI, KAJ.

Glover, Gwynne, and Samuel 1279; Agnew 10796.

4. SEDUM *L.*

Erect or trailing herbs with entire, opposite or alternate fleshy leaves and cymose inflorescences; calyx of 5 fleshy segments of differing sizes; petals 5, free or nearly so; stamens 10, fused to the corolla at base; carpels 5, 1–many-seeded.

1	Petals white; follicles 1-seeded	1. *S. crassularia*
	Petals yellow; follicles many-seeded	2
2	Leaves whorled at base of plant; anthers wedge-shaped, longer than broad	2. *S.* sp. *A*
	Leaves mostly alternate at base of plant; anthers orbicular, as long as broad	3
3	Plant woody at base, with pustulated stems	3. *S. ruwenzoriense*
	Plant herbaceous, with smooth stem	4. *S. meyeri-johannis*

1. Sedum crassularia *R.-Ham.*

A small trailing plant forming cushions of blue-green fleshy leaves; flowers white- or purple-tinged, scattered.

Uncommon plant found in stony, solifluction soils in the alpine zone. HA, HK.

Hanid, Agnew, and Mendes 111; Hedberg 1552.

2. Sedum *sp.* **A.**

A spreading herb with cylindrical acute leaves and yellow flowers in a corymbose terminal cyme.

In stony soil at upper forest levels. HE.

Tweedie 67/305.

Locally common plant found in streams and rivers, and showing surprising tolerance to cold at higher altitudes. HE, HT, HA, MUM, BAR, MAC, KAJ.

Lind, Agnew, and Kettle 5902; Hedberg 47.

2. SPHAEROTHYLAX *Krauss*

Herbs, with or without leaves; flowers arising inverted from within a well-developed one-sided spathe; perianth of two minute linear segments, the filaments joined; ovary with free-central placentation and 2 stigmas; capsule longitudinally ribbed.

Sphaerothylax abyssinica *Warm.*

Plant with thalloid creeping portion and erect branching portion bearing capillary, divided segments; flowers arising from the thallus and from one upper node; filaments joined to close below the anthers.

Locally common plant found in rapids and waterfalls of larger rivers in warmer country. MUM, MAC.

Napper 409; Lind and Agnew 5901.

21. ELATINACEAE†

Herbs or low shrubs; leaves opposite or whorled, simple, with paired stipules; flowers solitary or in cymes, regular, bisexual, axillary, small; sepals 3–5, free, imbricate; petals as sepal number, free, imbricate, persistent; stamens equalling or twice as many as petals, free; ovary superior, 3–5 locular; styles 3–5, free; ovules numerous, axile; fruit a septicidal capsule; seeds exalbuminous.

1. BERGIA *L.*

Herbs or undershrubs, often pubescent or glandular-pubescent; leaves opposite, sessile or subsessile, entire or serrate; flowers pedicelled and fascicled (in ours); sepals 5 (in ours), keeled, with hyaline margins; petals equalling or slightly shorter than sepals; stamens usually 5 or 10; ovary usually 5-locular; carpels almost free; style one per carpel; fruit dehiscing from apex downwards; seeds brown or almost black, subcylindric, 3-angled or with rounded ends.

Bergia ammannioides *Roth*

Small erect or decumbent annual with sessile oblanceolate or oblong-elliptic leaves and white or pinkish flowers in dense verticillate clusters.

Herb of moist places, often a weed of cultivated land. More material desirable. EMB.

Bogdan 4443.

† By M. A. Hanid.

22. CARYOPHYLLACEAE‡

Mostly herbs, with simple, usually opposite, stipulate or exstipulate leaves; flowers mostly bisexual, regular, in cymose inflorescences; sepals 5, free or connate; petals 5, free, sometimes absent; stamens 5 or 10, free; ovary of 2–5 connate carpels, with free-central or rarely axile placentation; fruit a capsule or achene; seed curved, endospermic.

1 Leaves with stipules — 2
　Leaves without stipules — 7
2 Leaves alternate — 6. *Corrigiola litoralis*
　Leaves opposite — 3
3 Flowers densely packed at nodes of normal leaves, as well as, sometimes, terminal; fruits one-seeded, indehiscent, enclosed in red fleshy bracts — 5. *Pollichia campestris*
　Flowers in terminal inflorescences, not densely packed at nodes of normal leaves; fruit a many-seeded dehiscent capsule, not enclosed in red fleshy bracts — 4
4 Leaves all linear; styles free — 4. *Spergula arvensis*
　Leaves not all linear; styles united — 5
5 Leaves orbicular to ovate; sepals sticky in fruit — 3. *Drymaria cordata*
　Leaves narrower than ovate; sepals not sticky in fruit — 6
6 Sepals scarious, acute; leaves cylindrical, linear — 1. *Polycarpaea*
　Sepals green, obtuse; leaves flat — 2. *Polycarpon prostratum*
7 Sepals free — 8
　Sepals connate — 11
8 Plants prostrate, cushion- or rosette-forming; capsule teeth as many as style number — 7. *Sagina*
　Plants erect or trailing, never forming a rosette or cushion; capsule teeth twice style number — 9
9 Styles 4–5 — 8. *Cerastium*
　Styles 2–3 — 10
10 Petals entire to emarginate — 9. *Arenaria foliacea*
　Petals deeply 2-lobed almost to base — 10. *Stellaria*
11 Flowers solitary; calyx bell-shaped — 11. *Uebelinia*
　Flowers in inflorescences; calyx tubular; erect plants — 12. *Silene*

1. POLYCARPAEA *Lam.*

Annual or perennial herbs, or suffruticose; leaves opposite or apparently whorled, stipulate; inflorescences of terminal cymes; flowers bisexual,

‡ By A. D. Q. Agnew.

3. Sedum ruwenzoriense *Bak.* (see p. 108)

A trailing or erect, softly woody small shrub with blunt cylindrical leaves and diffuse terminal cymes.

Common in rock crevices in the heath and lower alpine zones. HE, HA, HK.

Mwangangi 387; Coe and Kirrika 252.

4. Sedum meyeri-johannis *Engl.*

A trailing herb, similar to *S. ruwenzoriense* in all respects except habit.

Locally common plant found in highland mist-forest as an epiphyte. HC, HM, HA.

Ivens 2057; Strid 2027.

5. UMBILICUS *DC.*

Perennial herbs with a tuberous root and alternate, peltate or cordate fleshy leaves; flowers in a terminal spike-like raceme; calyx of 5 nearly free lobes; corolla tubular, constricted at the mouth, of 5 fused petals; stamens 10; follicles 5, free, with numerous seeds.

Umbilicus botryoides *A. Rich.* (see p 108)

A small glabrous herb with peltate, circular, crenate, dimpled leaves and an erect raceme of pendulous white or greenish flowers.

Uncommon plant found in rock crevices in wet, montane forest. HE, HC, HM, HA, HK, RV.

Agnew 9067; Meinertzhagen 9325.

19. DROSERACEAE†

Herbs with alternate stipulate leaves; leaves bearing specialized hairs which trap and digest insects; inflorescences racemose or cymose; flowers bisexual, regular; sepals 4–8, connate at base, petals 4–8, free; stamens 5–20 (usually 5); ovary superior, of 3–5 connate carpels, with many ovules on parietal placentas; fruit a loculicidal capsule, seeds small, with endosperm.

1. DROSERA *L.*

Insectivorous herbs; leaves entire, with long sticky hairs; sepals and petals 5; stamens and ovary as in the family.

1 Plant with a trailing stem, the living leaves occupying an appreciable distance of it, internodes covered with reddish scarious stipules; sepals pilose-ciliate
1. *D. madagascariensis*

Plants with rosettes of leaves with no internodes visible; sepals not pilose-ciliate 2

2 Peduncles glandular-pubescent; leaf lamina abruptly narrowing into the petiole
2. *D. burkeana*

Peduncles pilose-glandular; leaf lamina gradually narrowing into the petiole
3. *D. pilosa*

1. Drosera madagascariensis *DC.*

Trailing perennial, with spathulate leaves, the internodes covered by glossy, laciniate, reddish stipules; inflorescence an erect raceme of pink to purple flowers.

Like all the Droseras of Kenya, these are rare plants which should be studied at every opportunity. This is a distinctive one, recorded only from Soy. HT.

Bickford in Bally 6259.

2. Drosera burkeana *Planch.*

Perennial herb with a rosette of spathulate leaves and erect racemes of pink or white flowers.

Only recorded once from Kenya, at Kinangop, and doubtfully distinct from the next species, which is here kept separate merely to record the little which is known about Kenya sundews. More study is required on these plants. HA.

Agnew 7158.

3. Drosera pilosa *Exell*

This species differs from *D. burkeana* only in the key characters.

See note on *D. burkeana.*

Bally B4940.

20. PODOSTEMACEAE‡

Submerged aquatics of fast-flowing water, with very much modified vegetative and reproductive organisation; stems often thalloid; leaves present or absent; flowers bisexual or unisexual; perianth 0–5, free; stamens 1–many; ovary superior of 2–3 carpels, with axile or free-central placentation; stigmas sessile, 2–3, seeds minute, numerous.

1 Plant body with minute flat leaves in 3 ranks
1. *Tristicha trifaria*

Plant body erect or creeping, passing into capillary divisions and with no 3-ranked flat leaves 2. *Sphaerothylax abyssinica*

1. TRISTICHA *Thouars*

Moss-like herbs with 3-ranked leaves, each 1 cell thick; spathe at base of pedicel minute; flowers with 3 loosely coherent perianth segments, one stamen and erect ovary with 3 carpels and axile placentation.

Tristicha trifaria (*Bory*) *Spreng.*

A creeping herb, 1–4 cm tall, forming moss-like patches on rocks in fast flowing water. The reddish erect capsules look like those of a moss.

† By A. D. Q. Agnew.

‡ By A. D. Q. Agnew.

6. CORRIGIOLA *L.*

Decumbent herbs with alternate, stipulate leaves; flowers small, axillary or terminal, bisexual, pentamerous; petals present, small; ovary surrounded by a perigynous receptacle, with 3 stigmas and a solitary basal ovule; fruit indehiscent, enclosed in the persistent calyx.

Corrigiola litoralis *L.*

Prostrate, glabrous annual or short-lived perennial, with linear to narrow-oblanceolate leaves; sepals often turning red in fruit; petals pink-white.

A very local weedy plant of mountain roadsides and disturbed ground, above 7000 ft. HT, HA, HK.

Gillett 16661; Agnew 7150.

7. SAGINA *L.*

Tufted, rosette, cushion-like or procumbent herbs with linear exstipulate leaves; flowers small, in cymes, often green, bisexual, pentamerous; sepals 4–5, free, green; petals 4–5 or absent, always smaller than the sepals; stamens 5–10; ovary with 4–5 styles, free-central placentation and numerous ovules; fruit a capsule opening by as many valves as there are styles.

1 Plant forming cushions by means of close-packed short leafy stems; no petals — 1. *S. afroalpina*
Plant forming rosettes, with no leafy shoots except for flowering shoots; petals present — 2. *S. abyssinica*

1. Sagina afroalpina *Hedb.*

A glabrous creeping perennial herb with short leafy stems usually forming a cushion; leaves linear, narrowing to a fine point; flowers 1–3 on axillary stems, green.

This pearlwort can be found along riverbanks and wet stony areas in the alpine belt above 9000 ft on Mt. Elgon, the Aberdares, and Mt. Kenya.

Coe 282.

2. Sagina abyssinica *A. Rich.*

Glabrous perennial herb with a rosette of leaves which usually hide the bases of the ascending flowering stems; flowers 5 to over 10 in loose dichasial cyme, green.

Often growing lower than *S. afroalpina* (7500–13 000 ft) this pearlwort is easily recognized by its distinct rosette habit, with the flowering stems appearing to come from below the rosette. It is found on the same three mountains as *S. afroalpina*, and it may be worth looking for on Cherangani. HE, HA, HK.

Kirrika 412.

8. CERASTIUM *L.*

Annual or perennial herbs, or suffrutescent; leaves sessile, opposite, exstipulate, entire; flowers bisexual in terminal dichasial cymes, or solitary; sepals 4–5, free; petals 4–5 or 0, emarginate or bifid, white; stamens 5–10; ovary with numerous free-central ovules and 4–5 styles; capsule cylindrical, often curved to one side with twice as many teeth as styles.

1 Lower 2–4 flowers of inflorescence solitary, apparently racemose; petals equal to or longer than calyx — 1. *C. afromontanum*
All flowers borne at ± the same height on the terminal cyme, crowded and touching one another, rarely but one solitary below the others and then in the first fork of the dichasium; petals longer or shorter than calyx — 2
2 Largest leaves usually more than 10 mm broad; pedicels and calyx viscid, so that the flowers of the dichasium easily adhere to one another — 2. *C. indicum*
Largest leaves never more than 9 mm broad; pedicels and calyx viscid or not, but even if so, then flowers seldom adhering to one another — 3
3 Erect or spreading annual; all leaves uniformly pilose below; petals absent or present, always bifid, shorter than the sepals — 3. *C. octandrum*
Creeping, stoloniferous perennial with ascending flowering stems; lower leaves glabrous except for the sometimes pilose midrib on lower side; petals present, shorter or longer than calyx, bifid to entire — 4. *C. adnivale*

1. Cerastium afromontanum *T.C.E. Fr. & Weimark*

A pilose and glandular perennial or possibly annual herb, with prostrate or ascending branches to 10 cm, lanceolate-elliptic leaves and solitary lower flowers; upper flowers 2–3 in a weakly developed dichasium.

A rather variable plant which can be more or less hairy and glandular. It is common in open short grassland and stream edges from 7500 ft up to 13 000 ft. HE, HC, HT, HM, HA, HK.

Strid 3205B; Hedberg 1618.

2. Cerastium indicum *Wight & Arn.* (see p. 113)

Trailing perennial pilose herb with ovate amplexicaul leaves and dense inflorescences of glandular flowers with no solitary flowers at base; sepals often adhere to one another.

pentamerous; sepals entirely scarious, not keeled, white, brown to purple; petals small; stamens 5; ovary with few to many ovules on free-central placentation, and with a 3 lobed to simple style; fruit a 3-valved capsule.

1 Dorsal surface of sepals hairy, often lanate
1. *P. eriantha*
Dorsal surface of sepals glabrous
2. *P. corymbosa*

1. Polycarpaea eriantha *A. Rich.*

An erect branched (at base) annual with hairy stem and linear glabrous leaves, bearing dense terminal corymbs of scarious white and red flowers.

An uncommon plant found in dry rocky places. The mature plant is almost umbrella-shaped, with the top covered with silvery white or pink flowers and stipules of the minute bracts. KIS, BAR, RV.

Glover 3764.

2. Polycarpaea corymbosa (*L.*) *Lam.*

Annual herb, erect to 40 cm, branching above into the inflorescence, otherwise similar to *P. eriantha* except for the sepals which are 3 mm long and glabrous, and the ovary which has 7–12 ovules.

A rare plant found in rocky places, only recorded from Machakos district. MAC.

Kirrika 134; Agnew 10084.

2. POLYCARPON *L.*

Annual or perennial herbs with opposite, often apparently whorled, stipulate leaves; flowers in cymes, terminating branches, bisexual, pentamerous; sepals 5, free, keeled; petals 5, shorter than the sepals; stamens 3–5; ovary with numerous free-central ovules, and one style with 3 stigmas; fruit a 3-valved capsule.

Polycarpon prostratum (*Forsk.*) *Aschers. & Schweinf.*

A glabrescent to pubescent annual herb, with ascending branches and spathulate or oblanceolate leaves; cymes small, terminal, of greenish-white flowers.

An apparently rare, recent introduction, only found so far at Limuru, but it may spread fast, and it may have been overlooked. HA.

Agnew 8292.

3. DRYMARIA *Roem. & Schultes*

Herbs, glabrous or hairy; leaves opposite, with expanded lamina, stipulate; flowers solitary or in terminal dichasial cymes; receptacle slightly perigynous; sepals 4–5, free; petals 4–5, bifid almost to base; stamens usually 5, the filaments shortly connate; ovary with 3 nearly free styles, and with 2-many ovules on free-central placentation; fruit a capsule with 3 valves.

Drymaria cordata (*L.*) *Roem. & Schultes* (see p. 113)

Straggling soft herb, usually glabrous, with broad-ovate cordate leaves and viscid-glandular inflorescences of white flowers.

A common herb in hedges, forest paths, and grassland edges in wetter forest zones from 4000–7500 ft in our area. Fruits and even young flowers are persistently picked up by one's trousers and on animals' coats, because of the viscid sepals. HE, HM, HA, HK, HN, KIT, MUM, EMB, MAC.

Agnew 5864; Kerfoot 4062.

4. SPERGULA *L.*

Annual herbs with linear, opposite, stipulate leaves; flowers in loose terminal dichasial cymes, pinkish or white, bisexual; sepals 5, free; petals 5, free; stamens 5; ovary with 3–5 free styles and free-central placentation of many ovules; fruit a capsule splitting into as many valves as there are styles.

1. Spergula arvensis *L.*

A prostrate or erect annual with apparently whorled, linear leaves and loose dichasia of pink or white flowers.

A local introduced weed of disturbed ground above 6000 ft. It is immediately recognized by its apparent whorls of linear leaves and sticky pink flowers. HT, HM, HA, RV.

Ivens 1131; Agnew 7148.

5. POLLICHIA *Ait.*

Trailing shrubs; leaves opposite, often appearing verticillate, stipulate; flowers bisexual, in dense sessile axillary cymes, surrounded by bracts of the cymes, pentamerous; sepals 5, free; petals 5, very small; stamens 1–2, borne with the perianth on a perigynous tube surrounding the 2-ovuled, single styled ovary; fruits in groups, surrounded by fleshy bracts and pedicels, each fruit one-seeded, indehiscent, surrounded by the persistent calyx.

Pollichia campestris *Ait.*

Straggling soft shrub or woody perennial, with apparently whorled, elliptic to lanceolate leaves; flowers green, fascicled axillary, turning red in fruit.

Fairly common, though never abundant, in disturbed grassland, waste places, and forest/grassland edges at medium altitudes, particularly in the Rift Valley. HM, HA, NAR, RV, MAC, NBI, KAJ.

Bally B8367; Agnew and Musumba 5478.

A common trailing plant of hedgerows, forest edges, and wet grassland in the area of wet highland forest, but not found above 9000 ft. The white flowers are quite showy at times. HM, HA, HK, KAJ.

Agnew 7665; Kerfoot 2822.

3. Cerastium octandrum *A. Rich.*

Annual or perennial hairy herb, with oblong or lanceolate leaves and terminal dichasia of tetramerous or pentamerous flowers.

An uncommon plant found from 7000 ft to the lower alpine zone, often in disturbed places, in grassland and open woodland. HE, HC, HT, HM, HA, HK, KIT.

Knight 95; Hedberg 188; Tweedie 66/371.

4. Cerastium adnivale *Chiov.*

A creeping stoloniferous perennial, sometimes forming cushions, with lanceolate, sessile leaves and strictly dichotomous dichasia of short-pedicelled flowers.

A common plant of alpine zones, growing generally slightly higher than *C. afromontanum*. The species is delimited here with the knowledge that a lot more observations and experiments are needed before we really know about *Cerastium* in East Africa. The forms with long entire petals appear distinct from those with short bifid petals, but the capsules are rather variable. HM, HA, HK.

Coe 315; Hanid 119.

9. ARENARIA *L.*

Herbs or suffrutescent plants, often cushion-like; leaves entire, opposite, exstipulate; flowers solitary or in dichasia, pentamerous; sepals free; petals free, entire, white or pink; stamens 10 or fewer; ovary with 3 styles and many ovules, placentation free-central; fruit a capsule opening by 6 teeth.

Arenaria foliacea *Turrill*

Erect, glandular-hairy annual with ovate leaves and greenish-white flowers in lax dichasial cymes, subtended by leaf-like bracts.

A rare plant, only recently recorded for Kenya in the Chyulu Hills. KAJ.

Hanid 202.

10. STELLARIA *L.*

Annual or perennial, often weak, herbs; leaves opposite, exstipulate; flowers solitary or in terminal dichasia, bisexual, small, parts in 5s or rarely 4s; sepals free; petals always deeply bifid almost to base, white, rarely 0; stamens 10 or fewer; ovary with 3 stigmas (rarely 2) and numerous free central ovules; fruit a capsule with 3 or 6 valves.

1 All flowers in long-pedunculate dichasia, with reduced bracts — 1. *S. mannii*
  Some or all flowers axillary or borne at branch forkings — 2
2 Leaves truncate to cordate at base; sepals 4; styles 2 — 2. *S. sennii*
  Leaves cuneate to rounded at base; sepals 5; styles 3 — 3. *S. media*

1. Stellaria mannii *Hook. f.*

Prostrate or straggling, annual or perennial herb, sparsely glandular hairy throughout, with ovate leaves, and white flowers in glandular-sticky dichasia.

A rather rare plant found in shady pathsides and the floor of wet highland forest, recorded from south of Mt. Kenya and Chyulu in our area. HK, KAJ.

Kabuye 60.

2. Stellaria sennii *Chiov.* (see p. 113)

A weak, trailing, sparsely hairy herb with ovate or heart-shaped cordate leaves and solitary flowers, petals very small or absent.

An uncommon plant found in wet highland forest edges and paths, often in shade. HE, HT, HM, HA, HK.

Agnew 7696; Gillett 16757.

3. Stellaria media (*L.*) *Vill.*

Annual, sparsely pilose herb with elliptic leaves and solitary white flowers.

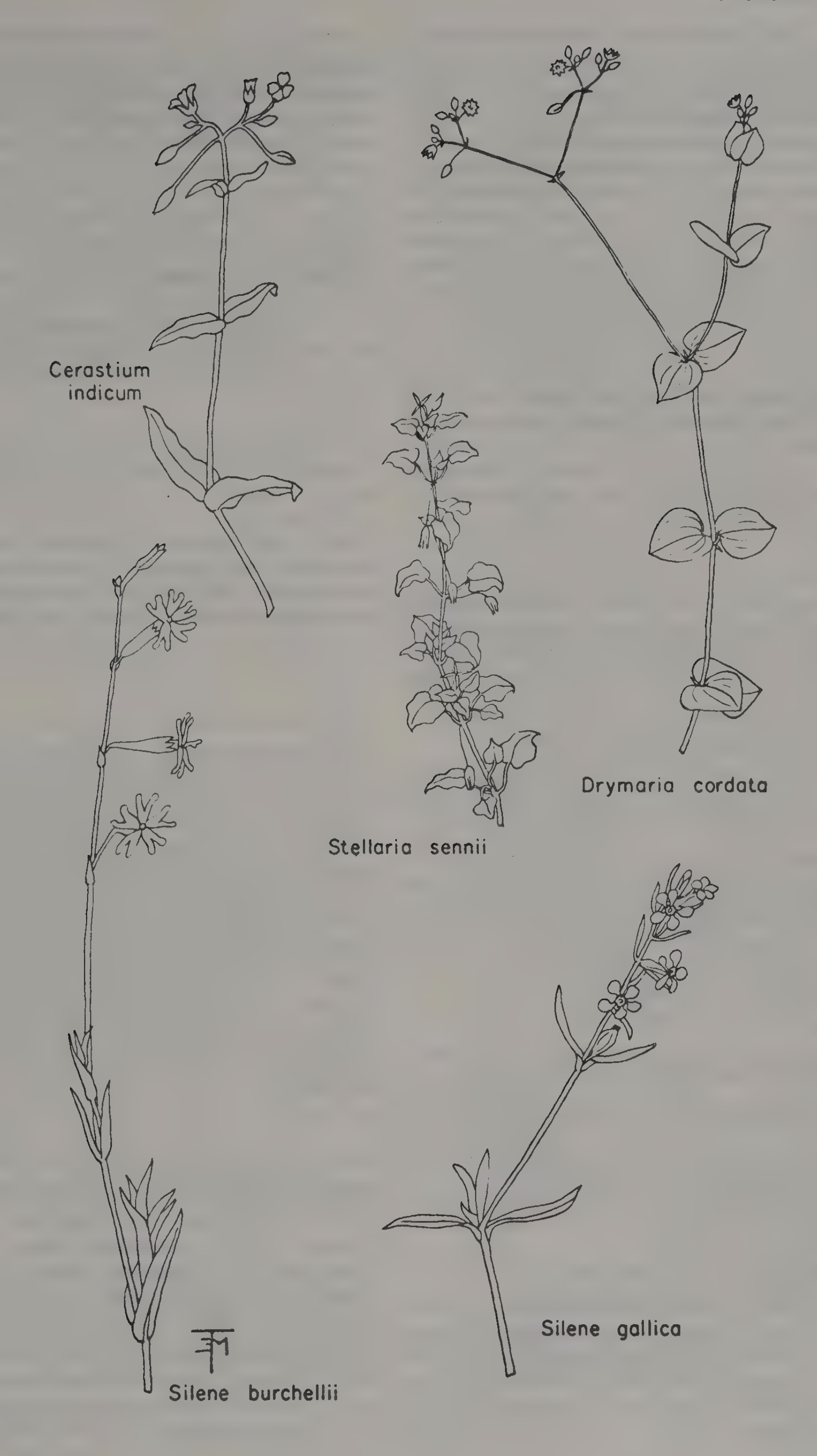
A locally abundant introduced weed in cultivation, especially gardens. HA, RV, NBI.

Gillett 16758.

11. UEBELINIA *Hochst.*

Herbs, prostrate or ascending; leaves opposite, exstipulate, flowers solitary, axillary, pentamerous; sepals connate; petals entire, white; stamens 10 or fewer; ovary with 3 or 4–5 styles and few, free-central ovules; capsule included within the persistent calyx, opening by as many septicidal valves as there are styles.

1 Stems ascending; calyx with minute spiny hairs and conical tube; petals much shorter and narrower than calyx lobes — 1. *U. abyssinica*
  Prostrate herbs; calyx softly hairy, with a bell-shaped tube; petals equal to or larger than calyx lobes — 2
2 Fruit and ovary 1-seeded — 2. *U. crassifolia*
  Fruit and ovary 3–4-seeded — 3. *U. rotundifolia*


Cerastium indicum
Drymaria cordata
Stellaria sennii
Silene gallica
Silene burchellii

Herbs or shrubs with leafy stems; inflorescence various 6
6 All leaves opposite 7
At least some leaves alternate 9
7 Flowers in pedunculate umbels 1. *Gisekia pharnaceoides*
Flowers solitary or in sessile glomerules 8
8 Style 1 6. *Trianthema*
Styles 2 7. *Zaleya pentandra*
9 Ovary inferior; fruit spiny or softly ornamented with fleshy bristles 9. *Tetragonia*
Ovary superior; fruit unornamented 10
10 Plant glabrous 10. *Corbichonia decumbens*
Plant hairy 11
11 Some nodes with opposite leaves (often the alternate nodes); flowers fasciculate at nodes 3. *Glinus*
All nodes with single leaves; flowers in pedunculate cymes 2. *Limeum viscosum*

1. GISEKIA *L.*

Annual herbs with opposite exstipulate sub-succulent leaves; inflorescences axillary, of umbels or dichasia; flowers bisexual or unisexual, pedicellate; sepals 5, free; stamens 5–20; ovary of 3–6 or 10–15 superior, free, one-seeded carpels; fruit of free achenes.

Gisekia pharnaceoides *L.* (see p. 118)

Trailing or shortly erect glabrous annual with oblong-linear leaves and crowded umbels of bisexual red or pink flowers.

Common in the drier grasslands after rain, particularly in Machakos and the Rift Valley. The pink flowers in tiny umbels not more than 1 cm in diameter serve to distinguish this plant from all others. MUM, KIS, BAR, RV, MAC.

Tweedie 67/100; Napier 10643.

2. LIMEUM *L.*

Glabrous or hairy herbs or shrubs with opposite or alternate exstipulate leaves; inflorescences cymose; flowers bisexual, small; sepals 5, free; staminodes 5 or absent, if present arising from the base of the outer stamens; stamens 7 (5 + 2) or 5; ovary superior, of 2 carpels with 2 styles, bilocular with one seed in each loculus; fruit separating into 2 mericarps.

Limeum viscosum (*J. Gay*) *Fenzl*

A glandular-hairy annual with obovate or spathulate leaves, and axillary clusters of green flowers.

An uncommon species of sandy and shallow soils in *Commiphora* bushland, and found in our area only from Lukenia eastwards through Machakos district. MAC.

Napper 1279.

3. GLINUS *L.*

Annual herbs with opposite leaves alternating with solitary leaves; flowers bisexual, in clusters at the nodes, pedicellate; sepals 5, free; staminodes 0 to many, usually divided at apex, not always petaloid; ovary superior of 3–5 loculi with axile placentation, and 3–5 sessile stigmas; fruit a capsule; seeds with a white aril and a filiform appendage from the hylum.

1 Leaves stellate-hairy; pedicels shorter than flowers 1. *G. lotoides*
Leaves glabrescent, with simple hairs; pedicels longer than flowers 2. *G. oppositifolius*

1. Glinus lotoides *L.*

A prostrate, stellate-pubescent annual with spathulate or elliptic leaves and 4–10 green flowers at each upper node.

A rather uncommon weed of sandy pond and riversides which grows in the dry weather after the water recedes. The flowers are green and inconspicuous. BAR, MAG, MAC, KAJ.

Mendes 1; Drummond and Hemsley 1249.

2. Glinus oppositifolius (*L.*) *DC.*

Erect or spreading, nearly glabrous subsucculent annual with oblanceolate leaves; flowers 4–12 at the nodes, on pedicels which are longer than the calyx.

In our area this species, as delimited here, is rare, only being found in Machakos, in the same type of habitat as *G. lotoides*. MAC.

There are many plants and populations of plants which show intermediate characters between these two species, and which may be hybrids. A study of these would be interesting. The putative hybrid is recorded from RV and NBI.

(Species) Kirrika 154; (Hybrid) Teesdale 26/461.

4. MOLLUGO *L.*

Annual herb with opposite or verticullate leaves, with or without small stipules; inflorescences cymose, often apparently umbelliform; flowers bisexual, inconspicuous; sepals 5, free; stamens usually 5, free; ovary superior, with 3–5 loculi and the same number of stigmas; ovules many, axile; fruit a capsule; seeds without an aril.

1 Scapose plant with a rosette of leaves at the base only 1. *M. nudicaulis*
Plant with whorls of leaves on the stem 2. *M. cerviana*

1. Uebelinia abyssinica *Hochst.*

An ascending herb with obovate, often asymmetric leaves, and white flowers ± clustered at the stem apex; styles 4–5; fruit 5–8-seeded.

A rare plant of marshes, only found once near Gilgil in HA.

Agnew 10122.

2. Uebelinia crassifolia *T.C.E. Fries*

A creeping, sparsely soft-hairy herb with obovate to orbicular subsessile leaves and solitary axillary white flowers; styles 3; fruit 1-seeded.

Locally common in subalpine grassland, especially where disturbed. This is recorded from Mt. Kenya but we have only seen it from the Aberdares. HA, HK.

Agnew and Armstrong 8166; Dent 1306.

3. Uebelinia rotundifolia *Oliv.*

Similar to *U. crassifolia* but with rather smaller leaves and many seeds per capsule. This species has been found on Mt. Kilimanjaro and Mt. Kenya in disturbed heathland and upper mist forest zones. HK.

Verdcourt 1988; Strid 2265.

12. SILENE *L.*

Herbs or suffrutescent plants with opposite, entire, exstipulate leaves; inflorescence cymose or, by reduction, racemose; flowers bisexual or rarely unisexual; sepals 5, connate into a tube; petals 5, with a narrow claw (in the calyx tube) and a dilated, usually bifid, limb; stamens 10; ovary with 3–5 stigmas, often stipitate, with axile placentation at base and the septa breaking down above; capsule with many ovules, usually retained within the persistent calyx, opening by 3–6 valves.

1 Annuals with spreading hairs; calyx less than 1 cm long; petals entire — 1. *S. gallica*
  Perennials, often suffrutescent, with appressed hairs or glabrous; calyx more than 1 cm long; petal limb deeply bifid — 2
2 Plant short-hairy, not viscid — 2. *S. burchellii*
  Plant glabrous, viscid on peduncle internodes — 3. *S. macrosolen*

1. Silene gallica *L.* (see p. 113)

Erect pilose-glandular annual, with sessile spathulate or oblanceolate leaves and unbranched racemes of short-pedicelled white flowers.

An introduced weed in a few areas in Kenya, usually found along roadsides and in cultivation. HT, HM, HA, KIT, RV.

Mendes 19; Nattrass 1002.

2. Silene burchellii *DC.* (see p. 113)

Perennial herb with linear acute leaves and racemes of 3–9 flowers; petals pale pink, cream, or purple.

Our commonest *Silene* though by no means abundant. As is common in this genus, the petals open at night, and remain open during the following morning only, becoming darker and curling as mid-day approaches. The plant can grow from medium altitude grasslands up into the moorlands of the alpine zone. HE, HC, HM, HA, HK, KIT, RV, NBI, KAJ.

Agnew 5455; Bogdan 3677.

3. Silene macrosolen *A. Rich.*

A perennial herb similar to *S. burchellii* but larger in all its parts and completely glabrous; inflorescence with viscid patches on peduncle, pedicels and rachis.

Rather rare, and found in fairly well watered but low altitude grassland. HA, HK, RV, KAJ.

Hanid 263; Kabuye 7.

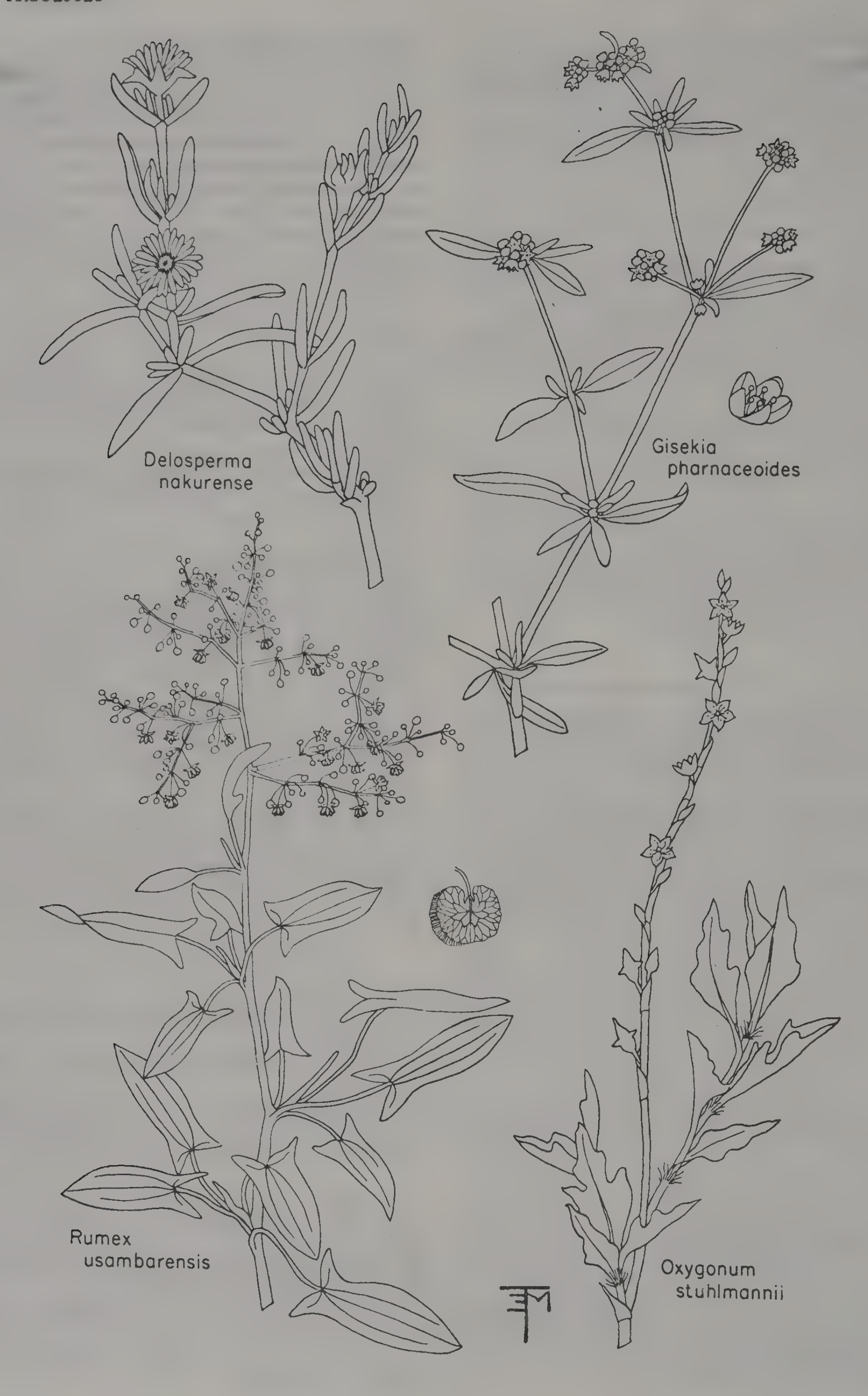
23. AIZOACEAE†

Herbs or shrubs, often succulent, with opposite or alternate, stipulate or exstipulate leaves; flowers bisexual, regular, solitary or cymose; sepals 5, connate or free; petals absent, often represented by petaloid staminodes; stamens 5-many; ovary variable, superior or inferior, of 1–2–5 united or free carpels, with axile placentation and 1–many ovules per loculus; fruit usually a capsule; seeds with a curved embryo.

This is a very vague and variable family, somehow held together (for the field botanist) by being plants near to, but obviously not of, the Caryophyllaceae and Portulacaceae/Phytolaccaceae.

1 Leaves linear or fleshy ± cylindrical — 2
  Leaves broader than linear, flat, not cylindrical — 5
2 Flowers on pedicels that are longer than the leaves — 3
  Flowers sessile or pedicels shorter than the leaves — 4
3 Perennial shrub — 5. *Hypertelis bowkerana*
  Annual herb — 4. *Mollugo cerviana*
4 Shrub; flowers white, 2–3 cm diameter — 8. *Delosperma nakurense*
  Annual, but occasionally woody; flowers pink or red, less than 1 cm in diameter — 6. *Trianthema*
5 Scapose annual with basal leaf rosette, and long-pedicellate flowers — 4. *Mollugo nudicaulis*

† By A. D. Q. Agnew.



Delosperma
nakurense
Gisekia
pharnaceoides
Rumex
usambarensis
Oxygonum
stuhlmannii

1. Mollugo nudicaulis *Lam.*

A glabrous annual with a rosette of spathulate leaves, and a dichotomous or sub-umbelliform scape of pink or red flowers.

A small, easily overlooked annual of shallow soils in lower altitude grassland, not very common, but widespread. HM, KIS, NAR, BAR, RV, NBI.

Agnew 9270; Leippert 5275.

2. Mollugo cerviana (*L.*) *Ser.*

A small, much branched glabrous annual herb with spathulate to linear leaves in whorls; flowers borne in groups on long capillary pedicels at each node.

A beautiful but tiny plant, often found in sandy dry stream beds or bare ground. In our area only recorded near Machakos. MAC.

Lucas and Williams in EAH 12322; Agnew 10081.

5. HYPERTELIS *Fenzl.*

Herbs or low soft shrubs, with alternate or whorled, linear, succulent, stipulate leaves; stipules persistent, adnate to leaf base, membranous; inflorescences axillary of long-pedunculate simple umbels; sepals 5, free; stamens 3–15; ovary superior, 3–5-loculate, with numerous axile ovules; fruit a loculicidal capsule.

Hypertelis bowkerna *Sond.*

A perennial (or possibly annual) glabrous herb or soft shrub with opposite or alternate, linear, fleshy, stipulate leaves and single umbels of long-pedicellate green flowers.

A rather rare plant found in disturbed bare ground in sandy grassland or dry bushland at low altitudes. RV, MAG, KAJ.

Verdcourt 3557.

6. TRIANTHEMA *L.*

Herbs, usually annual, with opposite, succulent, often unequal leaves, obscurely stipulate; flowers axillary, solitary or in groups; sepals 5, connate, the lobes awned; stamens 5 to many, arising from the calyx tube; ovary of one carpel, with follicular placentation and one style; seeds 2 or more.

1 Leaves broad-elliptical or obovate, usually more than 3 cm long, densely pilose; flowers more than 8 mm long — 1. *T. ceratosepala*

Leaves usually narrow-elliptical or linear, never more than 3 cm long, glabrous or sparsely papillose; flowers less than 5 mm long — 2. *T. triquetra*

1. Trianthema ceratosepala *Volkens & Irmsch.*

Spreading or erect pilose woody annual or short-lived perennial, with obovate to elliptic leaves; flowers 1–3 together, bright purple or pink within.

Occasional in alkaline and subsaline soils, and certain localities (which may be alkaline) in *Acacia-Commiphora* bushland. In our area only known from Amboseli. KAJ.

Agnew 7307; Verdcourt 2540.

2. Trianthema triquetra *Willd.*

A crystalline-papillose annual with linear to orbicular leaves and reddish flowers in groups of 2–6, very shortly pedicellate or sessile.

On saline and alkaline clays and restricted to these areas. This plant is abundant where it occurs. BAR, MAG, KAJ.

Agnew 7306; Knight 5/65/2.

7. ZALEYA *Burm. f.*

Annual or perennial herbs with opposite, exstipulate leaves; flowers in nearly sessile axillary groups, bisexual; sepals 5, connate into a tube, the lobes with dorsal mucros; stamens 5–15, free, inserted on the calyx tube; ovary superior, of 2 united carpels, with 2 free stigmas, and 2 axile ovules per carpel; fruit a capsule.

Zaleya pentandra (*L.*) *Jeffrey*

A spreading or erect subsucculent annual with narrowly or broadly elliptic leaves which have the petiole base expanded into white-membranous wings, and with some bracts reduced to scarious leaf bases, resembling stipules; flowers subsessile at the nodes, crowded, pinkish.

Not uncommon in sands in hotter districts, especially near Lake Victoria in west Kenya. HE, MUM, KIS, NAR, BAR, RV, MAG, NAN, MAC.

Bally 19543; Hanid and Kiniaruh 746.

8. DELOSPERMA *N. E. Br.*

Perennial herbs, suffrutescent or stemless with opposite succulent ± cylindrical leaves without stipules and with no radiating hairs at their tips; flowers solitary, axillary or terminal; sepals 5, connate, with unequal lobes, succulent; staminodes many, petaloid, lanceolate; stamens many, free; ovary inferior, with 5 loculi and 5 stigmas; ovules many, parietal not axillary in each loculus; fruit a capsule, dehiscing at the top to expose the numerous seeds.

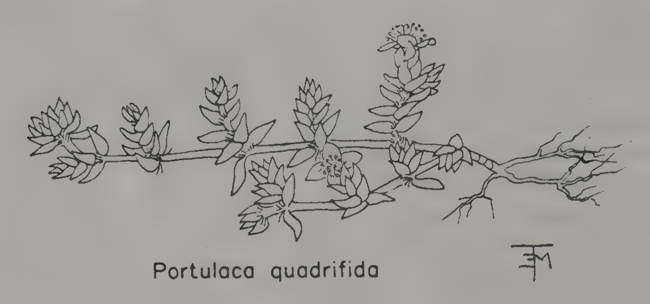
Delosperma nakurense (*Engl.*) *Herre* (see p. 118)

A glabrous shrubby perennial with sessile fleshy linear leaves and white or pink flowers.

Portulaca oleracea

Portulaca foliosa

Talinum portulacifolium



Portulaca quadrifida

Locally common in parts of the Rift Valley and occasionally elsewhere, this plant apparently likes to grow amongst loose friable rocks in dry bushland or grassland. HA, NAR, RV, MAC.

Agnew 9440; Glover 3617.

9. TETRAGONIA *L.*

Herbs or shrubs with entire alternate exstipulate leaves; flowers solitary or fasciculate, axillary; sepals 3–5, connate into a tube above the ovary; stamens few to many, alternate with the calyx lobes; ovary nearly or quite inferior, with 1–9 loculi, each with 1 ovule; fruit indehiscent, dry, often ornamented.

1 Fruit covered with soft fleshy spines — 1. *T. acanthocarpa*
  Fruit with 3–5 rather blunt horns — 2. *T. tetragonioides*

1. Tetragonia acanthocarpa *Adamson*

A semi-succulent papillose annual herb, with elliptic to rhombic leaves, and solitary greenish to pink flowers.

An uncommon weed, introduced from South Africa, but now naturalized in disturbed pastures in the Rift Valley, especially around Gilgil. RV.

Agnew and Azavedo 9311; Verdcourt 3233.

2. Tetragonia tetragonioides (*Pallas*) *O. Ktze.*

A succulent glabrous annual with ovate-rhombic leaves and axillary sessile yellow-green flowers.

A New Zealand plant, occasionally found as an escape from cultivation. RV.

Bally 12263.

10. CORBICHONIA *Scop.*

Herbs with alternate subsucculent exstipulate leaves; flowers bisexual, in pedunculate cymes; sepals 5, free; petaloid staminodes many; stamens many; ovary superior, with 5 styles, 5 loculi, and many ovules; fruit a loculicidal capsule.

Corbichonia decumbens (*Forsk.*) *Exell*

A usually prostrate glabrous annual or perennial herb, with obovate apiculate leaves and 5–10-flowered terminal dichasia of pinkish flowers.

An uncommon weed found in dry bushland, easily recognized by its glaucous apiculate leaves and pinkish stems. Only recorded from Lakes Baringo and Magadi in our district, but found just outside it at Mtito Andei. BAR, MAG.

Strid 2244; Glover 2960.

24. PORTULACACEAE†

Herbs or rarely shrubs, often succulent; leaves sessile or petiolate, alternate or opposite; stipules scarious or modified into setose axillary appendages or absent; flowers bisexual, regular, solitary or variously racemose, paniculate or cymose; sepals 2, imbricate, free or united at the base; petals 4–6, imbricate, free or connate up to halfway or more, usually fugacious; stamens as many as and opposite the petals or more numerous, free or epipetalous; ovary usually superior, 1-celled, placentation free-central or basal; fruit a capsule dehiscing by valves or by a transverse slit (circumscissile) rarely an indehiscent nutlet; seeds globose-reniform, endospermous.

1 Leaves with stipular hairs at the base — 1. *Portulaca*
  Leaves without stipules at the base — 2
2 Plant less than 10 cm tall, a minute alpine herb; petals white — 2. *Montia fontana*
  Plant over 10 cm tall, a robust lowland herb or shrub; petals yellow or purple — 3. *Talinum*

1. PORTULACA *L.*

Erect or prostrate herbs; leaves shortly petiolate or sessile; stipules usually divided into numerous hairs; flowers sessile, solitary or in small groups at the ends of branches and surrounded by 2-several leaves; sepals unequal, united at the base; petals marcescent and surrounding the ripe capsule; stamens 7–13 in ours, epipetalous or perigynous; ovary semi-inferior, 1-celled, usually multiovulate, capsule circumscissile; seeds smooth, tuberculate or granulate.

1 Stipular hairs very few, inconspicuous, caducous, about 1 mm long; leaves obovate-spathulate, apex rounded or truncate — 1. *P. oleracea*
  Stipular hairs usually numerous, persistent, more than 1 mm long; leaves various but not spathulate — 2
2 Leaves terete or subterete, linear — 3
  Leaves flattened, lanceolate-acuminate or elliptic to ovate — 5
3 Seeds with sinuate edges to tubercles, interlocking as in a jigsaw puzzle — 4
  Seeds with smooth, entire, straight edges to tubercles — 2. *P.* sp. *A*
4 Stipular hairs few at nodes but numerous around flowers, about 3–5 mm long, seeds about 0·5 mm in diameter, shining grey-black with conical tubercles — 3. *P. foliosa*

† By M. A. Hanid.

3. TALINUM *Adans.*

Perennial herbs or shrubs with somewhat succulent, exstipulate, alternate or subopposite leaves; flowers in axillary or terminal cymes, racemes or panicles, rarely solitary; sepals 2, opposite; petals 5, free or joined at the base; stamens 5-indefinite; ovary superior, 1-celled, multiovulate; style 3-lobed; capsule globose or ovoid, dehiscing longitudinally into 3 valves; seeds with a distinct hilum, smooth or tuberculate, ridged or pitted.

1 Flowers purplish or purplish-pink; peduncles terminal bearing a long raceme or racemose panicle — 1. *T. portulacifolium*
Flowers yellow; peduncles axillary bearing 1–3 flowers — 2
2 Seeds with prominent concentric ridges, without pits — 2. *T. caffrum*
Seeds with narrowly oblong tubercles with minute pits at the edges of tubercles — 3. *T. crispatulatum*

1. Talinum portulacifolium (*Forsk.*) *Schweinf.* (see p. 120)

Glabrous perennial herb or small shrub, with obovate to oblanceolate fleshy leaves and long terminal racemes of many purple to purple-pink flowers; pedicels recurved in fruit.

A common *Talinum* of drier bushland in Kenya, often with brightly coloured flowers. MUM, KIS, NAR, BAR, MAG, NAN, MAC, KAJ.

Hanid and Kiniaruh 761.

2. Talinum caffrum (*Thunb.*) *Eckl. & Zeyh.*

Glabrous perennial herb from a thickened fleshy root, with usually oblanceolate, elliptic-lanceolate or linear leaves and axillary solitary yellow flowers.

In open bushland or grassland below 6000 ft. NAR, MAG, NAN, MAC, KAJ.

Hanid and Kiniaruh 557; Napier 2353.

3. Talinum crispatulatum *Dinter*

Erect or suberect perennial succulent herb very similar to *T. caffrum*, except for the seeds which are without concentric ridges but with narrowly oblong, slightly raised tubercles arranged in concentric rings radiating from the hilum; seed tubercles with minute pits at their edges.

An uncommon plant of dry bushland or grassland and stream-side rocks which needs more collecting and careful field notes on habit and floral characters. MAG, MAC, KAJ.

Agnew, Kiniaruh, Ngethe, and Wyatt 8843; van Someren 2480.

25. POLYGONACEAE†

Plants variable in habit, but mostly herbs with alternate leaves in which the stipules are usually dilated into an amplexicaul cup around the stem at the insertion of the petiole; flowers regular, usually bisexual, usually in compound inflorescences of panicles of fascicles; sepals 3 or 6 (rarely 4–5), free; petals absent; stamens 5–9, (in ours) usually 6; ovary superior, sessile, with one loculus, one basal ovule and 2–3 styles with capitate stigmas; seeds with much endosperm.

1 Fruiting calyx with 3 hard radiating spines — 2
Fruit without 3 calyx spines — 3
2 Fruits axillary from female flowers; male flowers in leafless racemes — 1. *Emex*
Fruits all from bisexual flowers in terminal leafless racemes — 6. *Oxygonum*
3 Fruiting calyx or fruit bearing hooks or wings for dispersal; flowers mostly green — 4
Neither fruiting calyx nor fruit bearing hooks or wings; flowers mostly pink — 5
4 Fruiting calyx winged or hooked, completely enclosing the unornamented fruit — 3. *Rumex*
Fruiting calyx unspecialized, exceeded by the bristly fruit — 2. *Harpagocarpus snowdenii*
5 Fruit much larger than fruiting calyx — 5. *Fagopyrum esculentum*
Fruit enclosed within fruiting calyx — 4. *Polygonum*

1. EMEX *Neck.*

Annual herbs, with stipular sheaths; flowers unisexual, the female axillary, the male on a narrow panicle; female flowers with 6 perianth segments in 2 series, all connate into a tube around the ovary, all becoming enlarged and woody in fruit, the outer forming 3 radiating simple spines; ovary with 3 fimbriate stigmas; male flowers with 6 sepals and 4–6 stamens.

1 Fruits 12–13 mm broad — 1. *E. australis*
Fruits 3–5 mm broad — 2. *E. spinosus*

1. Emex australis *Steinh.*

An erect glabrous annual with ovate leaves and axillary sessile clusters of female flowers.

A rare weed at medium altitudes, not seen for 15 years. Possibly introduced from South Africa. HT, KIT, NBI.

Brodhurst-Hill 423.

2. Emex spinosus (*L.*) *Campd.*

Similar to *E. australis* from which it differs in the smaller fruits.

† By A. D. Q. Agnew.

Stipular hairs numerous both at nodes and around flowers, 7–9 mm long, seeds about 1 mm in diameter, dull grey-black, with peg-like tubercles 4. *P. kermesina*

5 Stipules mostly broadened at the base, up to 7 mm long, silvery-white; tubercles of seeds raised with edges sinuate and interlocking like a jigsaw puzzle; a small erect herb to 5 cm tall 5. *P. parensis*

Stipules mostly filiform, 3–5 mm long, whitish; tubercles of seeds rounded with edges entire and not sinuate; a prostrate creeping annual herb to 30 cm long 6. *P. quadrifida*

1. Portulaca oleracea *L.* (see p. 120)

A glabrous annual with numerous spreading branches bearing alternate obovate-spathulate leaves with inconspicuous stipular hairs; flowers yellow, in terminal clusters.

A widespread *Portulaca*, found as a nitrophilous weed of gardens, cultivation, railway tracks and roadsides. Flowers open only for a short time in the morning. HE, KIT, MUM, BAR, RV, MAC, NBI, KAJ.

Hanid and Kiniaruh 539; Pratt 315.

2. Portulaca *sp.* **A.**

Annual or perennial succulent herb with ascending branches and leaves clustered at branch apices; stipular hairs 3–5 mm long, golden; flowers yellow.

An uncommon plant so far collected from stony dry ground or rocks in Nanyuki area and dry grassland in Loita area, which is similar to *P. foliosa* except for the seeds. The above description is based on the three specimens recorded below. More collecting and careful field notes are needed to ascertain whether one or two species are represented here or whether these are variants or hybrids of other species. HL, NAN.

Moreau 69; Harger 35; Glover, Gwynne, Samuel, and Tucker 2234.

3. Portulaca foliosa *Ker-Gawl.* (see p. 120)

Annual or robust perennial herb or low shrub with subterete glaucous leaves and golden to white stipular hairs; flowers usually solitary, with pinkish sepals and yellow or orange petals.

A fairly common *Portulaca* of stony dry grassland and scrubland at medium altitudes. Appears to have wide ecological tolerance; more information needed on its ecology. KIS, NAR, BAR, MAC.

Lind, Agnew, and Beecher 5715; Napper 1560.

4. Portulaca kermesina *N. E. Br.*

Similar to *P. foliosa* but with the stipular hairs more numerous and longer (over 5 mm usually), and with yellow flowers.

On dry sandy or stony soils and on rocks in the hotter and drier southern parts of our area. More collection and field notes on habit, floral and fruit characters are needed. NAR, RV, MAC, NBI, KAJ.

Agnew and Tweedie 9281; Polhill 24.

5. Portulaca parensis *Poelln.*

A low annual or perennial herb with fleshy leaves and numerous, long silvery stipular hairs; flowers often solitary.

The most easy to recognize of the *Portulacae*, this species is apparently rare, but may have been overlooked. It is recorded only from Suswa on rocky ridges at 6000 ft. More collections and field notes on floral and fruit characters are required. RV.

Glover, Wateridge, Donet, and Sulbei 3439.

6. Portulaca quadrifida *L.* (see p. 120)

Prostrate annual herb up to 30 cm long; stems slender often rooting at the nodes; leaves opposite, up to 10 mm long but often much less, variable in size and shape, often lanceolate to elliptic-oblong, apex usually acute; stipular hairs numerous, 3–5 mm long, whitish; sepals united at the base; petals usually 4, yellow or orange, rarely pink or purplish, almost free; stamens 8–12; capsule conical-ovoid; seeds many, about 1 mm in diameter, dull grey, tubercles rounded.

Common in stony dry grassland and scrubland at medium altitudes; often a weed of cultivated land and roadsides. HE, HA, KIT, KIS, NAR, RV, MAC, NBI.

Agnew, Hanid, and Kiniaruh 9251; Verdcourt 3173.

2. MONTIA *L.*

Annual to perennial glabrous herbs with opposite, entire leaves and flowers solitary or in terminal cymes; sepals persistent; petals 3–5, free or united; stamens 3–5, at base fused to the petals; ovary superior; fruit a 3-valved capsule.

Montia fontana *L.*

A creeping tufted herb with narrow spathulate to obovate stem leaves and small white flowers in inconspicuous lateral cymes.

Locally common plant found in wet places in the alpine zone on Mt. Kenya. HK.

Borruso, January 1968.

6. Rumex crispus *L.*

An erect, almost glabrous, perennial (or possibly annual) herb similar to *R. bequaertii* except for the fruiting sepals.

A rare adventive from Southern Europe which has been collected once only (1948) on the banks of the Nairobi River. NBI.

Bally B 4621.

4. POLYGONUM *L.*

Herbs or shrubs with alternate leaves, the stipular sheaths often with terminal fringes of stiff bristles; flowers bisexual, usually in dense terminal racemes or spikes or heads; sepals usually 5, petaloid, persistent, not enlarging in fruit (in ours); stamens 5–8; ovary with 2 or 3 styles; fruit usually a black and glossy achene.

1 Twining climbers — 2
Erect or prostrate or scrambling herbs or shrubs — 3

2 Sepals winged, the wings decurrent along the pedicel — 1. *P. baldschuanicum*
Sepals unwinged — 2. *P. convolvulus*

3 Flowers in a pedunculate capitate head, with or without a clasping leaf around the base of the capitulum — 4
Flowers in a spike or raceme or axillary, not capitate — 5

4 Leaf ovate, acuminate, with a winged petiole — 3. *P. nepalense*
Leaf elliptic, with a short unwinged petiole — 4. *P. capitatum*

5 Flowers in clusters in the axils of foliage leaves — 6
Flowers in pedunculate leafless racemes — 7

6 Perennial woody trailing shrub of altitudes above 8500 ft — 5. *P. afromontanum*
Annual erect herb, of altitudes lower than 8000 ft — 6. *P. aviculare*

7 Peduncles with stalked glandular hairs — 7. *P. strigosum*
Peduncles glabrous or hairy but without stalked glands — 8

8 Plant annual; racemes interrupted, with a zig-zag axis; leaves ± linear — 8. *P. salicifolium*
Plant perennial; racemes crowded, hardly interrupted except sometimes at base; leaves usually broader — 9

9 Plant robust; stipular sheaths truncate, usually without terminal bristles; fruit lens-shaped with dimpled or concave faces — 9. *P. senegalense*
Plant robust or not; stipular sheaths always fringed; fruits lens-shaped or 3-angled, always with convex faces — **10**

10 Leaves with over 22 pairs of lateral nerves, softly hairy below, usually with 2–3 longitudinal undulations in the narrow-lanceolate lamina; flowers heterostylic; fruit always lens-shaped — 10. *P. pulchrum*
Leaves with less than 20 pairs of lateral nerves, glabrous or with stiff hairs below, flat, the lamina usually broad-lanceolate or almost ovate; flowers not heterostylic; fruit lens-shaped or 3-angled — 11. *P. setosulum*

1. Polygonum baldschuanicum *Regel*

A cultivated ornamental which is only mentioned and keyed here since it may escape in places and has been recorded from Meru district.

2. Polygonum convolvulus *L.*

Climbing, twining, almost glabrous annual herb with ovate acuminate or triangular hastate leaves and fascicles of flowers in racemes or axillary; sepals enlarging to enclose the sharply 3-angled fruit.

Another introduced weed from Europe, now doing quite well in arable cultivation above 5500 ft. HE, HT, HM, HA, KIT, NBI.

Irwin 228.

3. Polygonum nepalense *Meisn.*

Glabrous or sparsely glandular-pilose straggling or erect annual, with triangular, often lobed leaves, and spicate or capitate inflorescences; flowers white or pink.

A plant of disturbed places in the area of high wet forest, occasionally growing as a field weed. HT, HM, HA, HK, KIS.

Kerfoot 4044; Agnew 8753.

4. Polygonum capitatum *Ham.*

A sparsely pilose prostrate herb, rooting at the nodes, with elliptic leaves and globular spikes of pink flowers.

Recorded once from 11 000 ft on the Aberdares, this plant, which is otherwise Himalayan, needs further collection and study. Possibly it is an escape from cultivation which has died or will die out.

Polhill 84.

5. Polygonum afromontanum *Greenway*

A nearly glabrous scrambling or trailing shrub with elliptic leaves and axillary clusters of few pink flowers.

Fairly common in the forest edges at the tree line on Mt. Kenya and the Aberdares. HA, HK.

Agnew 8672; Gillett 16902.

A local weed of cultivation, often in wheat-growing areas. Introduced from the Mediterranean. HT, HA, NBI.

Krauss 320.

2. HARPAGOCARPUS *Hutch. & Dandy*

Climbing, nearly glabrous herbs with cordate entire leaves; flowers bisexual, sepals 5, 2 small and 3 large; stamens 8; ovary 3-angled, becoming bristly along the angles (the bristles having retrorse barbs) in fruit.

Harpagocarpus snowdenii *Hutch. & Dandy*

An almost glabrous perennial climbing or straggling herb with ovate to lanceolate sagittate acuminate leaves and erect inflorescences of fascicles of flowers; sepals enlarging in fruit; fruit orange, with red barbed bristles.

An uncommon plant of forest edges, clearings and streamsides in wetter highland forest below 8000 ft. HC, HK, HN.

Agnew and Coe 8781; Verdcourt and Polhill 2963.

3. RUMEX *L.*

Erect herbs or shrubs, with conspicuous sheathing stipules and leaves nearly always acid-tasting; flowers bisexual or unisexual, fascicled in panicles, sepals 6, in 2 series of 3, the inner whorl enlarging and often becoming ornamented in fruit; stamens 6; ovary with 3 feathery styles; fruit 3-angled, enclosed in the sepals.

1 Leaves hastate or sagittate at base — 2
  Leaves neither hastate nor sagittate, the base rounded, truncate or cuneate — 4
2 Flowers dioecious (unisexual); low herb to 30 cm with most leaves basal — 1. *R. acetosella*
  Flowers bisexual; herbs more than 30 cm tall, or shrubs, with many stem leaves — 3
3 Basal lobes of leaves less than 5 mm broad; plant shrubby, sometimes climbing — 2. *R. usambarensis*
  Basal lobes of leaves more than 10 mm broad; a stout erect herb to 4 m — 3. *R. abyssinicus*
4 Inner sepals toothed at edges in fruit, the teeth long and hooked — 4. *R. bequaertii*
  Inner sepals entire or shallowly cut in fruit but with no teeth — 5
5 Sepals in fruit entire, without a central tubercle — 5. *R. ruwenzoriensis*
  Sepals in fruit entire or slightly dentate, with a central tubercle — 6. *R. crispus*

1. **Rumex acetosella** *L.* (*Acetosella vulgaris* (Koch.) Fourr. *Rumex angiocarpus* Murb.)

An erect dioecious perennial herb with a basal rosette of lanceolate or oblong leaves.

An introduced weed, liable to occur in the wheat districts of Kenya, but not recently collected. It is rather unlike the rest of the *Rumex* species that we have here, and has been put into a separate genus, *Acetosella.* This genus contain a number of species, one of which (*Acetosella vulgaris*) is relatable to our material. HT, NBI.

Hocombe 1425.

2. **Rumex usambarensis** (*Dammer*) *Dammer* (see p. 118).

A glabrous weak shrub or climber often with fascicles of the oblong-elliptic hastate leaves; inflorescence a very complex panicle of reddish flowers; sepals enlarging to become orbicular and prominently net-veined in fruit.

A very beautiful plant in flower and fruit, with its red or crimson tresses of flowers. Common in most areas except the wetter forests and at higher altitudes, it is often seen along roadsides and is one of the shrubby plants which first invade cleared woodland around Nairobi. HM, HA, RV, MAC, KAJ.

Hanid 260; Glover 3588.

3. **Rumex abyssinicus** *Jacq.*

A large glabrescent erect perennial herb with triangular hastate leaves and an erect compound panicle of crowded green flowers; sepals becoming similar to those of *R. usambarensis* in fruit but smaller and straw-coloured.

Locally common in waste places, at higher altitudes than *R. usambarensis* although there is considerable overlap. HE, HT, HM, HA, KIT, NAR, RV, MAC, NBI, KAJ.

Strid 2723; Bogdan 5714.

4. **Rumex bequaertii** *De Wild.*

A glabrous erect perennial herb with narrow-lanceolate or linear-oblong leaves and erect racemes of fascicled flowers.

With *R. abyssinicus,* our commonest dock, growing in the area of upland forest and found on streamsides, pathsides, etc. HE, HC, HT, HM, HL, HA, HK, HN, KIS, MAC, NBI.

Harmsen 6551; Hedberg 1481.

5. **Rumex ruwenzoriensis** *Chiov.*

Erect or ascending sparsely pubescent perennial herb with oblong-lanceolate to ovate leaves; inflorescence similar to *R. bequaertii* but sepals ovate, obtuse, entire, without tubercles in fruit.

The common dock found above 7500 ft on the Aberdares and Mt. Kenya, often growing along streamsides. HA, HK.

Agnew 7030; Hedberg 1934.

6. Polygonum aviculare *L.*

A glabrous prostrate or ascending annual with sessile narrow-elliptic leaves and axillary groups of red-pink flowers.

An introduced and spreading weed of cultivation, above 7000 ft. Originally European. HT, HA, KIT.

Bogdan 5630; Mendes 21.

7. Polygonum strigosum *R. Br.*

Erect sparsely pilose, possibly annual herb sometimes trailing, with linear, oblong to lanceolate leaves often truncate or hastate at base; racemes of pink flowers often dichotomously branching.

A rare *Polygonum* which has occasionally turned up in many parts of Kenya. HC, HT, HA, NBI.

Lind 2290; Tweedie 67/336.

8. Polygonum salicifolium *Willd.* (see p. 125).

An erect glabrescent annual with elliptic, almost sessile, leaves and a terminal group of slender interrupted racemes of pink or white flowers.

A common waterside plant, particularly along streamsides up to 8000 ft. HC, HT, HM, HL, HA, KIT, MUM, NAR, RV, EMB, MAC, NBI.

Kerfoot 2611; Agnew 8297.

9. Polygonum senegalense *Meisn.*

An erect, variably hairy softly shrubby perennial, the stem often ± covered with the conspicuous, slightly inflated, brown stipular sheaths; leaves lanceolate, acute, glabrous or densely white-tomentose; racemes 2–6, of pink or white flowers.

A common herb of riversides, streamsides and marshes, up to 8500 ft in our area. There are two distinct forms which intergrade rarely, but apparently show no ecological preferences; var. *senegalense* is almost glabrous (except for the small yellow glands) while var. *albotomentosum* is densely white-tomentose. HT, HA, KIT, MUM, KIS, NAR, RV, EMB, MAC, NBI.

Glover 3984; Agnew and Musumba 5467.

10. Polygonum pulchrum *Blume*

A softly hairy perennial herb with narrow-lanceolate entire leaves, often with longitudinal undulations; racemes 1–5, terminal, of pink flowers.

A locally common waterside plant, often found around artificial dams; up to 7500 ft. HT, HM, HA, HK, KIT, MUM, KIS, NAR, RV, EMB, NBI.

Tucker 2292; Lind, Harris, and Agnew 5106.

11. Polygonum setosulum *A. Rich.* (see p. 125)

A roughly hairy perennial herb with lanceolate-ovate or elliptic leaves and inflorescences as in *P. pulchrum*.

A common waterside plant, often growing at higher altitudes than the other species, from 4000–9000 ft. HE, HM, HA, KIT, MUM, KIS, NAR, RV, NBI.

Glover 2083; Harmsen 6550.

5. FAGOPYRUM *Miller*

Erect annuals with sagittate leaves; stipular sheaths present, entire; flowers heterostylous, axillary or in raceme-like panicles; sepals 5, not thickening in fruit; stamens 8; styles 3; fruit much larger than the perianth, 3-angled.

Fagopyrum esculentum *Moench.*

A glabrous or puberulent erect annual with triangular hastate or cordate leaves and axillary long-pedunculate crowded racemes.

A rare escape from cultivation, when it is occasionally grown for chicken feed. HT, NBI.

Turner in Bally 5035.

6. OXYGONUM *Burch.*

Herbs with alternate leaves, and often extra-axillary branching; stipular sheaths present, the leaves emerging from their centre; inflorescence a narrow, interrupted raceme of groups of short-pedicelled flowers borne within the bracts which are reduced to stipular sheaths; flowers heterostylous, unisexual or bisexual; sepals forming a tube around the ovary becoming a hardened, often prickly, case in fruit.

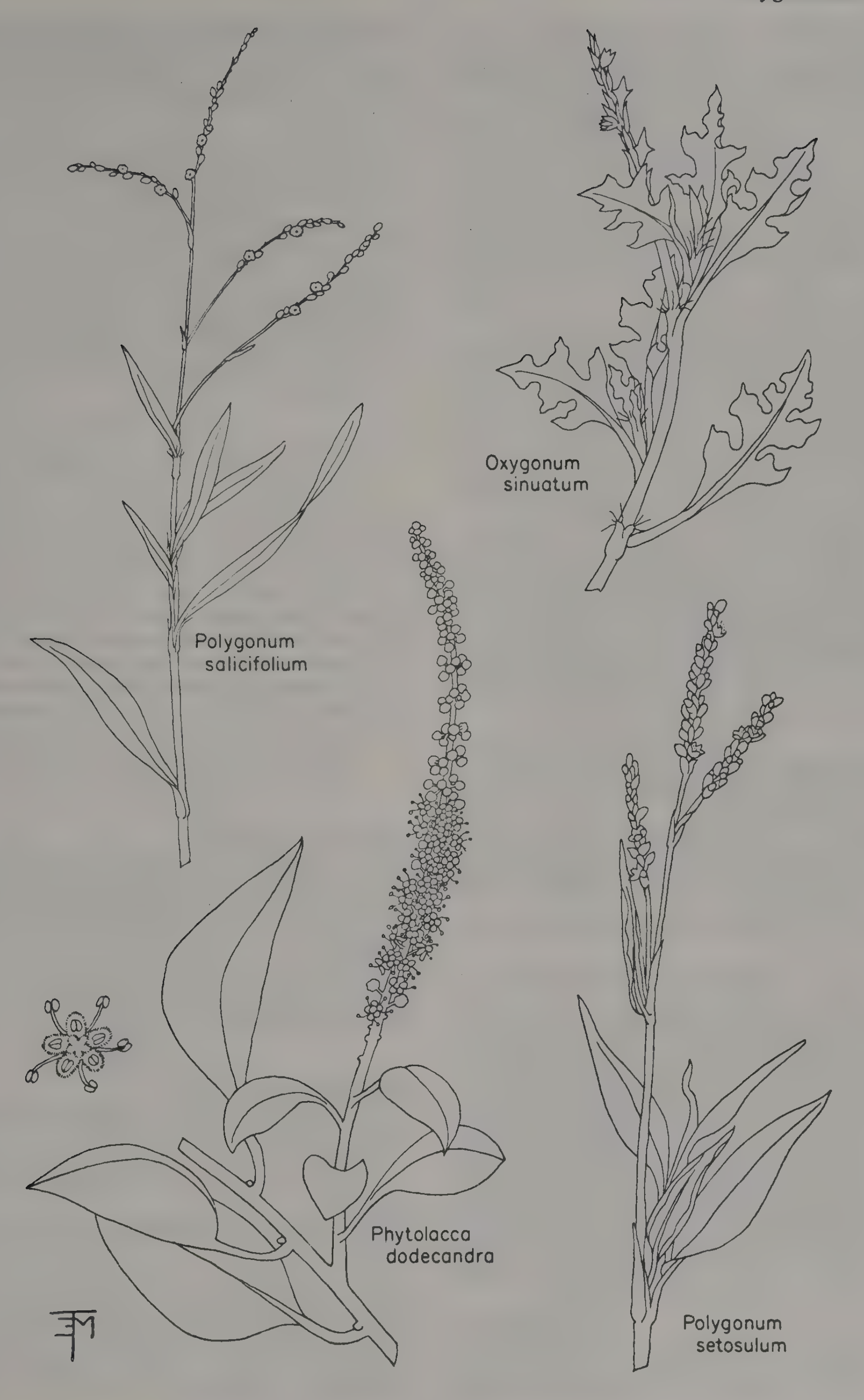
1 Stipular sheaths with green photosynthetic ± spreading teeth at apex; leaves glabrous — 1. *O.* sp. *A*
  Stipular sheaths papery throughout; leaves mostly hairy — 2
2 Leaves minutely undulate at margin, as well as often lobed; stigmas and anthers separated from each other in the flower by at least the length of an anther — 2. *O. stuhlmannii*
  Leaves not or hardly undulate at margin, as well as often lobed; stigmas and anthers touching or nearer to each other than one anther length — 3. *O. sinuatum*

1. Oxygonum *sp.* **A.**

A glabrous perennial trailing shrub with ascending stems and linear to lanceolate leaves which usually bear one pair of lateral pointed lobes; flowers pink, not markedly heterostylic.

Locally common in dry country in shallow or rocky soils. MAC.

Lind and Agnew 5668; Strid 2138.


Oxygonum
sinuatum
Polygonum
salicifolium
Phytolacca
dodecandra
Polygonum
setosulum

2 Leaves glabrous, not spine-tipped
4. *Suaeda monoica*
Leaves hairy or spine-tipped 5. *Salsola*
3 Leaves with long woolly hairs
3. *Kochia indica*
Leaves without woolly hairs 4
4 Leaves usually pinnatifid, and glandular-pubescent 1. *Chenopodium*
Leaves usually dentate or entire, lobed and densely mealy 2. *Atriplex*

1. CHENOPODIUM *L.*

Herbs, often glandular-pubescent, rarely glabrous, with leaves alternate and mostly petiolate; flowers in cymose clusters or glomeruli, with bisexual and unisexual flowers mixed; bracteoles absent; calyx usually 4–5-lobed, unchanged in fruit; stamens 1–5; style usually absent; fruits one-seeded with membranous indehiscent pericarps; seeds vertically or horizontally compressed, endospermous.

1 Plant more or less mealy, at least on young parts, with grey or whitish vesicular hairs, other sorts of hairs and glands absent 2
Plant pubescent, and with yellow to amber glands, aromatic, without vesicular hairs 6
2 Seeds sharply keeled on margin; testa marked with very close minute rounded pits; pericarp very difficult to detach from seed
1. *C. murale*
Seeds bluntly keeled on margin; testa not marked as above; pericarp readily rubbed or scraped from seed 3
3 Seeds 1–1·5 mm in diameter; testa marked with radial furrows, and often also with minute roughnesses in between, never closely pitted 4
Seed 1·5–2 mm in diameter; testa furrowed or pitted 5
4 Upper leaves with acute teeth as well as ± acutely lobed at base 2. *C. album*
Upper leaves with rounded lobes and a ± undulate leaf margin 3. *C. opulifolium*
5 Leaves below widest point cuneate and normally entire, sometimes broadly cuneate; teeth up to about 10 each side, usually fewer, not acuminate, usually directed upwards 2. *C. album*
Leaves below widest point rounded in outline to subtruncate or even subcordate and distinctly toothed; teeth 7–60 each side, usually numerous, acuminate or acute, tending to be directed outwards
4. *C. fasciculosum*
6 Inflorescence built up of distinct though sometimes small dichasial cymes in the axils of leaves or bracts these cymes usually aggregated as though into a spike; seeds black or nearly so when ripe; stamens 1–2; lower and median leaves pinnately divided, at least below; sepals always keeled 7
Inflorescence built up of small sessile or subsessile clusters of flowers in the axils of leaves or bracts, flowers not in dichasial cymes; seeds red-brown to blackish when ripe; stamens 1–5; leaves and sepals various 8
7 Seeds 0·9–1·1 mm in diam.; some glands shortly but distinctly stalked (use ×20 lens); lower part of leaves pinnately divided, (top part toothed but scarcely lobed) the lobes acute
5. *C. procerum*
Seeds 0·7–0·8 mm in diam.; glands all sessile (use ×20 lens); leaves pinnately divided throughout each side usually to within 2–3 mm of midrib, the lobes usually rounded
6. *C. schraderanum*
8 Sepals keeled on the back, the keel wing-like and broadening upwards 7. *C. carinatum*
Sepals rounded, not at all keeled on back 9
9 Some seeds in each cluster 'vertical' others 'horizontal', 0·5–1·25 mm in diam.; stamens 4–5; ovary glandular above; stigmas 3–4, long 8. *C. ambrosioides*
All seeds in each cluster 'vertical', 0·5–0·75 mm in diam.; stamens 1; ovary not glandular; stigmas 2, short 9. *C. pumilio*

1. Chenopodium murale *L.*

Erect or spreading annual herb, mostly sparsely mealy; leaves variable, usually rhombic-ovate with 5–15 coarse irregular ascending teeth at margin; inflorescence of leafy, divaricately branched cymes.

A common but variable weed of crops, old cultivations and pasture land. RV, NBI.

Greenway 12522; Lugard 272.

2. Chenopodium album *L.*

Annual grey-mealy herb; leaves very variable, mostly longer than broad, rhombic to lanceolate; inflorescences of dense rounded terminal clusters.

A common weed of cultivated land. HT, KIS, RV, NBI.

Agnew, Hanid, and Kiniaruh 7909; van Someren 194.

3. Chenopodium opulifolium *Koch & Ziz*

Grey-mealy annual or perennial herb, often woody below; leaves mostly broadly or shortly rhombic-ovate, other characters as in *C. album*.

2. Oxygonum stuhlmannii *Dammer* (*O. maculatum* R. Grah.) (see p. 118)

A pubescent perennial or facultative annual herb with ovate to lanceolate to rhombic leaves; flowers pink, strongly heterostylic.

A variable plant as defined here, which includes annual and almost shrubby perennial forms which grow together in some areas (for example near Ulu), as well as the glabrous and pubescent-leaved forms which are separated in the FTEA into two distinct species. In our area we have intergrading plants between all of these forms and only more intensive field work can help us to understand the variation. This species is found in dry, sandy country from Narok and Machakos to the coast. NAR, MAC.

Verdcourt 2158; Agnew 9222.

3. Oxygonum sinuatum (*Meisn.*) *Dammer* (see p. 125)

An almost glabrous annual, with elliptic to oblanceolate or obovate leaves bearing 1–2 pairs of shallow lobes, or entire; flowers pink, not markedly heterostylic.

This species is only found (in Kenya) at medium altitudes, never at the Coast. It is our commonest *Oxygonum* with nasty prickly fruits, and is found in waste places generally. HM, HA, KIT, MUM, KIS, NAR, RV, MAG, EMB, MAC, NBI.

Bally B 8025; Hanid and Kiniaruh 742.

26. PHYTOLACCACEAE†

Herbs, trees, or shrubs, with alternate, entire exstipulate leaves; flowers in racemes, bisexual or rarely unisexual; bracts and bracteoles present; sepals usually 5, sometimes more; petals absent; stamens 5–30; anthers longitudinally dehiscent; ovary of 1–12 free or loosely connate carpels, with separate stigmas, each with one basal ovule; fruit fleshy, often of drupes; seed with a curved embryo surrounding the endosperm.

1 Annual herb with one carpel — 1. *Hilleria latifolia*
  Perennial shrubs with 8–12 carpels — 2. *Phytolacca*

1. HILLERIA *Vell.*

Herbs with terminal racemes; flower bisexual, with 4 unequal free sepals; stamens 4; ovary of one carpel with a sessile fringed stigma and one ovule; fruit lens-shaped with the fleshy pericarp ± fused to the black seed.

† By A. D. Q. Agnew.

Hilleria latifolia (*Lam.*) *Watt.*

Erect, sparsely pubescent annual with ovate-elliptic leaves and shortly pedunculate racemes.

An uncommon plant found in lowland damp conditions. HM, HK, MUM, NAR.

Glover, Gwynne and Samuel 389.

2. PHYTOLACCA *L.*

Shrubs or herbs, sometimes scrambling, with ± fleshy leaves and bisexual or unisexual flowers in terminal or leaf-opposed racemes; sepals 5; stamens 5–25, inserted on a fleshy disc; carpels 5–12, free or connate with free stigmas, forming a globose fleshy fruit of drupes.

1 Most pedicels longer than sepals; carpels free — 1. *P. dodecandra*
  All pedicels shorter than sepals; carpels connate — 2. *P. octandra*

1. Phytolacca dodecandra *L'Herit.* (see p. 125)

A climbing, scrambling, or ± erect glabrous shrub with bluntly ovate-elliptic leaves and long terminal trailing racemes of pedicellate yellowish flowers.

A local plant of bushland and cleared forest at medium altitudes. Although often found as a low trailing shrub, it can grow as a strong liane in riverine forest. HE, HA, RV, NBI.

Agnew 9071; Kirrika 473.

2. Phytolacca octandra *L.*

A woody, glabrous soft shrub with lanceolate-elliptic leaves and leaf-opposed racemes of subsessile yellowish flowers.

A rare plant, possibly introduced from North America, to be found in waste places at medium altitudes. HT, HA, NBI.

Lind and Harris 5114; Kokwaro 312.

27. CHENOPODIACEAE‡

Annual or perennial herbs or shrubs, often halophytic, with alternate or rarely opposite, exstipulate, simple leaves which are sometimes reduced to scales; flowers inconspicuous, greenish to grey, solitary and axillary, often clustered, usually regular, bisexual or unisexual; calyx usually 2–5-lobed, united below, persistent, often accrescent in fruit; petals absent; stamens as many as sepals or fewer, opposite to sepals; ovary superior, 1-celled, uniovulate; fruit indehiscent or circumscissile; seed with a curved peripheral embryo, endosperm present or absent.

1 Leaves terete — 2
  Leaves flat — 3

‡ By M. A. Hanid.

2. Atriplex muelleri *Benth.*

Erect annual herb or subshrub with ascending branches, and spathulate to elliptic or rhombic-ovate leaves; inflorescence of axillary glomeruli; fruiting bracteoles semicircular to triangular in outline with acute or subacute apex and 1–4 little teeth on each side.

An uncommon weed of cultivation which has been introduced from Australia. It is recorded from Elmenteita and Naivasha only. Information on habit needed. RV.

Bogdan 2021.

3. Atriplex halimus *L.*

Woody herb or shrub, much branched, densely mealy, with ovate to oblong or elliptic leaves; inflorescence a terminal panicle with ultimate branchlets spiciform and mostly leafless towards the top; fruiting bracteoles as broad as, or more often broader than, long, reniform to broadly deltoid-ovate with denticulate or almost lobed margins.

A rare but locally common plant which is recorded as growing on seasonally flooded saline soils with short sparse grass and on volcanic ash. It is recorded only from near Ol Tukai on raised beds of Lake Amboseli in our area, and is certainly worth looking out for in other areas of Kenya. KAJ.

Greenway 9203; Verdcourt 3118.

3. KOCHIA *Roth.*

Glabrous or hairy herbs or shrubs with sessile, alternate or rarely subopposite leaves; flowers small, sessile, axillary, solitary or clustered, bisexual and female; bracteoles absent; perianth 5-lobed, lobes horizontally winged outside and incurved; stamens 5; fruits depressed-globose; seeds orbicular.

Kochia indica *Wight*

Densely tomentose, silvery grey-green annual with narrowly elliptic to oblanceolate leaves and small axillary clusters of a few flowers; fruit with short thick broadly triangular-ovate wings.

A rare but locally common plant found in saline soils recorded only from Amboseli near Ol Tukai. KAJ.

Verdcourt 2536; Western 50.

4. SUAEDA *Scop.*

Suaeda monoica *J. F. Gmel.* is dealt with in KTS p. 139. KAJ.

5. SALSOLA *L.*

Herbs, shrubs, or undershrubs, more or less pubescent, leaves somewhat fleshy, alternate or rarely opposite, sessile, sometimes scale-like; flowers small, axillary, solitary or fascicled, bisexual, 2-bracteolate; sepals 4–5, each with a scarious horizontally spreading wing from above the middle in fruit; stamens 5 or fewer; stigmas usually 2; fruit with fleshy or membranous pericarp, enclosed in the calyx; seeds usually vertically compressed, non-endospermous, with membranous testa.

1 Pubescent or glabrescent shrub; leaves up to 4 mm long, apex without spine — 1. *S. dendroides*
  Spinescent woody herb; leaves more than 4 mm long, apex spine-tipped — 2. *S. pestifera*

1. Salsola dendroides *Pallas*

Profusely and densely branched glabrescent shrub with small fleshy linear to boat-shaped or scale-like leaves and sessile flowers; fruit with transversely elliptic or deltoid-obovate wings, each over 2 mm long.

A plant of low rainfall areas found in semi-desert scrub and on sand near rivers. HE, NAN.

Nattrass 1495.

2. Salsola pestifera *A. Nels.*

Pubescent annual woody herb with spinescent linear-terete leaves and sessile flowers; fruit with 1–1·5 mm long wings.

A rare, but locally common, introduced weed of cultivation recorded only from a farm near Rumuruti. NAN.

Bumpus in Bogdan 4197.

28. AMARANTHACEAE†

Herbs, low shrubs, and a few climbers, with alternate or opposite, simple, usually entire, exstipulate leaves; inflorescences mainly dichasial cymes, and these often in racemes, or by reduction, racemes and spikes of solitary flowers; one bract and 2 bracteoles always present for each flower; flowers unisexual or (more often in ours) bisexual, some often sterile and involved in fruit dispersal; sepals 5, rarely fewer; petals 0; stamens 5, rarely fewer, often fused into a filament sheath at base, which may bear 5 staminodes; ovary superior of 1-many free-central ovules, pendulous or erect; fruit a capsule (often enclosed in the persistent calyx or even inflorescence) with circumscissile or irregular dehiscence; embryo usually curved round the endosperm.

1 Leaves, at least those above the first 2–3 nodes of the seedling, alternate — 2
  Leaves opposite — 7

† By A. D. Q. Agnew.

Our commonest *Chenopodium* species which is closely related to *C. album*. It is a weed of cultivation, roadsides, and settled areas at medium altitudes. HT, HM, HA, KIT, MUM, RV, MAC, NBI.

Agnew and Musumba 5354; van Someren 158.

4. Chenopodium fasciculosum *Aellen*

Mealy to glabrescent, much branched, erect or rarely spreading annual with ovate dentate leaves; inflorescences of divaricately branched cymes.

A common *Chenopodium* of upland evergreen forest, roadsides, and a weed of cultivation. There are two varieties which are separable according to the number of little teeth in mature leaves. One variety has few little teeth while in the other they are numerous. HT, HM, HA, KIT, KIS, NAR, BAR, RV, NAN, MAC, NBI, KAJ.

Bogdan 5711; Kerfoot 2871.

5. Chenopodium procerum *Moq.*

Erect glandular-pubescent annual herb with elliptic or ovoid-elliptic leaves; inflorescence of dichotomously branched axillary cymes usually aggregated into a leafy or nude continuous cylindrical terminal inflorescence.

A local *Chenopodium* of upland grasslands, and a weed of cultivated and waste places; below 8500 ft. HE, HC, HT, HM, HA, KIT, NAR, RV, NBI.

Njoroge 66; Agnew, Kibe, and Mathenge 10486.

6. Chenopodium schraderanum *Schult.*

Erect glandular-pubescent annual with elliptic to oblong pinnatifid leaves; inflorescence as in *C. procerum* but often smaller.

A locally common *Chenopodium* of medium altitudes which has become a weed of cultivation, waste places, and roadsides. HE, HT, HM, HA, KIT, NAR, RV, NAN, NBI.

Strid 2567; Bogdan 5666.

7. Chenopodium carinatum *R. Br.*

A trailing aromatic herb with ovate, obtusely lobed leaves and axillary glomerules of flowers.

This introduced plant smells of peppermint and is locally common in waste and disturbed rocky places. KIT, MAC, NBI.

Agnew and Haines 8238; Bogdan 5594.

8. Chenopodium ambrosioides *L.* (see p. 138)

Erect, strongly aromatic, pubescent annual with elliptic or obovate leaves; inflorescence a much branched panicle, ultimate branches with spicately arranged small sessile flower-clusters.

A common introduced weed of cultivation, disturbed land, dry grassland, roadsides, often near human habitations. HA, KIT, NAR, MAC, NBI.

Agnew and Tweedie 9293; Glover, Gwynne, and Samuel 179.

9. Chenopodium pumilio *R. Br.*

Annual pubescent-glandular herb, usually prostrate, sometimes erect, with elliptic to lanceolate, obscurely toothed or lobed leaves; inflorescence of small cymose glomeruli mostly at nodes, apically condensed into spike-like racemes.

A common weed of cultivation, disturbed land, often found by railways and roadsides; very common in some places. It seems to be variable in habit, size, leaves, and inflorescence, perhaps owing to habitat. Specimens from riverine forest may be 50 cm high and have toothed leaves up to 8 cm long, and smaller glomeruli, well-spaced on thin branches. HT, HM, HA, KIT, KIS, RV, MAC, NBI.

Agnew 8217; Bogdan 5666.

2. ATRIPLEX *L.*

Mealy annual or perennial herbs, shrubs or undershrubs, with vesicular hairs; leaves alternate or rarely opposite; flowers in axillary glomeruli or aggregated into terminal panicles or spikes, monoecious or dioecious; male flowers without bracteoles, with 3–5-lobed calyx and 3–5 stamens; female flowers with 2 accrescent bracteoles connate at the base; without calyx and staminodes; fruits enclosed in the persistent enlarged bracteoles, with membranous indehiscent pericarp; seeds laterally compressed, endospermous.

1 Plants with prostrate branches; mature leaves up to about 1 cm wide; fruit red, fleshy — 1. *A. semibaccata*
  Plants with erect or ascending branches; mature leaves more than 1 cm wide; fruit dry, green — 2
2 Inflorescences axillary; leaf-margins with 1–4 coarse teeth on each side — 2. *A. muelleri*
  Inflorescence a terminal panicle; leaf-margins entire or with 1–2 small lateral lobes on each side — 3. *A. halimus*

1. Atriplex semibaccata *R. Br.*

Mealy perennial undershrub with prostrate branches and oblanceolate to oblong-lanceolate or narrowly obovate leaves; inflorescences of small axillary cymose glomeruli; fruiting bracteoles cherry-coloured, sweet to the taste.

A weed of cultivated land, gardens, and roadsides which seems to prefer alkaline soils. The lower leaf surfaces are conspicuously mealy. It is mainly recorded from Naivasha area. RV, MAC.

Verdcourt 3597; Thomas 1421.

2. Celosia trigyna *L.*

Erect glabrous or sparsely puberulent annual with ovate leaves and compound terminal racemes of widely spaced cymes of pink or white flowers.

An uncommon ruderal weed of waste places in the wetter lowlands of Kenya, and occurring in our area only in MUM, KIS, MAC.

Hanid and Kiniaruh 791; Dowson 455.

3. Celosia schweinfurthiana *Schinz.*

Annual or perennial, glabrous, prostrate, or scrambling herb with ovate to lanceolate leaves and terminal as well as accessory racemes of well-spaced cymes of pedicellate cream flowers.

A rare plant of wet lowland forests which grows also at the coast, often as a prostrate annual, but in Malaba forest as a climber at forest edges. MUM.

Strid 3389; Graham 21.

4. Celosia anthelmintica *Asch.* (*C. leptostachya* Benth. of Check List)

A glabrous or sparsely hairy scrambler on trees and shrubs, with ovate leaves and terminal racemes of widely scattered cymes of white (drying cream) flowers.

A common plant of the Magadi-Nairobi area and the adjacent Rift Valley, but hardly known outside this region. HA, NAR, BAR, RV, MAG, NAN, NBI, KAJ.

Agnew and Beecher 8285; Glover 3991.

2. AMARANTHUS *L.*

Usually annual, often glabrous herbs, with alternate exstipulate entire leaves prominently nerved below; inflorescences of glomerules of cymes, either axillary or in terminal spike-like racemes; flowers small, crowded, unisexual (in ours monoecious), usually overtopped by bracts and bracteoles in the cymes; sepals variable 2–5; stamens 3–5, exserted at anthesis, free, without staminodes, anthers 4-locular; styles 2–3; fruit 1-seeded, circumscissile or rupturing irregularly.

A genus, principally American, which has been widely cultivated and accidentally introduced, so that the following list is merely of species which have been already recorded, while more will probably be found in the future. The fact that so many species have hybridized makes the taxonomy difficult, and the conclusions of the present author will probably have to be drastically revised in the future.

1 Inflorescences terminal and axillary — 2
  Inflorescences all axillary — 6
2 Most nodes with a pair of divaricate sharp spines; leaves often darker below — 1. *A. spinosus*
  Nodes without sharp spines; leaves concolorous — 3
3 Fruit circumscissile — 4
  Fruit rupturing irregularly or indehiscent — 2. *A. lividus*
4 Racemes never less than 7 mm (usually more than 10 mm) in diam. at their narrowest cylindrical parts, tapering abruptly into the apex, with a softly spiny appearance — 3. *A. hybridus* ssp. *hybridus*
  Racemes less than 7·5 mm (usually 5 mm) in diam. at their narrowest cylindrical part, tapering gradually to the apex — 5
5 Racemes sometimes nodding; capsule smooth, hemispherical above the line of dehiscence — 4. *A. caudatus*
  Racemes never nodding; capsule wrinkled, conical above the line of dehiscence — 3. *A. hybridus* ssp. *incurvatus*
6 Perianth longer than the fruit; fruiting inflorescence with a spiny appearance; fruit circumscissile — 5. *A.* sp. *A*
  Perianth shorter than fruit; fruiting inflorescence without a spiny appearance; fruit circumscissile or not — 7
7 Leaves emarginate or bifid; fruit indehiscent — 8
  Leaves entire at apex except for a small mucro; fruit circumscissile — 6. *A. graecizans*
8 Annual or creeping perennial; leaves bifid; fruits rounded above, green — 7. *A. acutilobus*
  Annual; leaves emarginate; fruit narrowing to an acute apex, blackish when dry — 8. *A. sparganiocephalus*

1. Amaranthus spinosus *L.*

An erect, sparsely branched, glabrous annual herb to 1 m; the pair of prophylls in the axil of every leaf frequently thickened into spines; leaves ovate-lanceolate; inflorescence a terminal panicle of spike-like racemes of cymes.

A common amaranth, easily recognized when it is spiny, but often difficult to spot when it is not. Widely distributed as a ruderal weed of hotter country below 6000 ft. HA, KIT, MUM, NAR, BAR, MAC, NBI.

Hanid and Kiniaruh 701; Glover, Gwynne, and Samuel 163.

2. Amaranthus lividus *L.*

An erect glabrescent annual, often rather sparsely branched, with ovate-elliptic leaves and axillary glomerules of flowers which coalesce to form a terminal spike-like raceme.

2 Leaves hairy on both surfaces 10. *Aerva*
Leaves glabrous or at most ciliate on margins and lower nerves 3
3 Inflorescence of simple spikes of single flowers 4
Inflorescence of cymes or of spike-like racemes of many-flowered cymes 6
4 Inflorescences axillary 11. *Nothosaerva brachiata*
Inflorescences terminal 5
5 Flowers green, imbricate; disseminule unwinged 12. *Psilotrichum schimperi*
Flowers pink or white, not imbricate; disseminule winged with outgrowths from 2 sterile flowers 3. *Digera muricata*
6 Erect or climbing herbs; flowers bisexual; sepals usually scarious; more than 1 seed per fruit 1. *Celosia*
Erect or prostrate herbs, never climbers; flowers unisexual; sepals herbaceous; 1 seed per fruit 2. *Amaranthus*
7 Inflorescence a simple spike of single fertile flowers (at least above the base of the spike) 8
Inflorescence a spike or raceme of dichasial cymes, each cyme containing 2-several fertile flowers 15
8 Spikes axillary 9
Spikes terminal 11
9 Spikes pedunculate 12. *Psilotrichum elliottii*
Spikes sessile 10
10 Bracts lanceolate, scarious, glabrous 15. *Alternanthera*
Bracts semiorbicular, woolly 10. *Aerva lanata*
11 Climber with fruiting spikes becoming long-hairy from a development of hairs in axils of bracteoles 4. *Sericostachys scandens*
Erect herbs or shrubs, or if scrambling, then without long tufts of hairs in fruiting bracteole axils 12
12 Flowers reflexed in fruit 13. *Achyranthes*
Flowers erect in fruit 13
13 Flowers enclosed and sepals hidden by keeled bracteoles 16. *Gomphrena celosioides*
Flowers not enclosed by bracteoles; sepals evident 14
14 Annual herb 12. *Psilotrichum schimperi*
Perennial shrub 14. *Achyropsis greenwayii*
15 Hooks or spines or bristles developed from sterile flowers, in axils of bracteoles and overtopping fruiting calyx; fruits usually adhesive 16
No sterile flowers present; hooks never present, and if spines present on fruit then these short and developed from bracteoles 19
16 Hooked bristles present, and fruit adhesive 17
Bristles simple, without hooks 18
17 Hooks spreading in stellate rings on glabrous stalks, more or less flat on the surface of the fruiting glomerule 8. *Pupalia lappacea*
Hooks erect in all parts of the fruiting glomerule, never stellate 7. *Cyathula*
18 Bristles all short and spiny 7. *Cyathula*
Bristles of two kinds, some long and soft, some shorter and spiny 9. *Dasysphaera prostrata*
19 Cymes 3 (or more)-flowered, not hardened or woody in fruit, straw coloured or grey 5. *Sericocomopsis*
Cymes 2-flowered only, hardened and woody in fruit, usually bright red or carmine 6. *Centemopsis rubra*

1. CELOSIA *L.*

Trailing plants, climbers, or erect herbs with alternate, usually entire leaves; inflorescence usually a long terminal raceme of cymose groups, often condensed; flowers bisexual; sepals often scarious; stamens fused at base; staminodes absent; anthers 4-locular; ovary with 2 or 3 styles; ovules 1–8; fruit a circumscissile capsule.

1 Inflorescence continuous, cylindrical, of close-packed, glossy flowers; sepals 7–9 mm long 1. *C. argentea*
Inflorescence interrupted, the flowers not close-packed except within the lateral cymes; sepals less than 4 mm long 2
2 Sepals scarious, ovate, delicate, white or pink; capsule ± equalling the sepals, widest below; stigmas 3 2. *C. trigyna*
Sepals stiff, oblong, cream, capsule usually exceeding the sepals, or if equalling them, then the capsules cylindrical; stigmas 2 or 3 3
3 Sepals drying dark brown or with a blackish line down the centre; capsule conical, not thickened above 3. *C. schweinfurthiana*
Sepals drying straw-coloured; capsule ± cylindrical, prominently thickened into two lobes above 4. *C. anthelmintica*

1. Celosia argentea *L.*

An erect glabrous annual with lanceolate-elliptic leaves and terminal, spike-like, cylindrical, glossy, white or pink inflorescences.

A rare plant of dry bushland in Kenya. This is the wild relative of the fasciculated 'cock's comb' of gardens. MAG, NAN.

Glover 3496.

An attractive annual of dry places in grassland, often on stony or sandy soil. KIS, BAR, NAN, MAG, MAC, KAJ.

Hanid and Kiniaruh 563; Glover and Samuel 2770.

4. SERICOSTACHYS *Gilg and Lopr.*

Climbing shrub with opposite entire leaves; inflorescence a terminal panicle of spikes; flowers sessile, bisexual, bracteate, with two bracteoles in the axil of each of which is a tuft of hairs representing a sterile flower which enlarges to long plumose structures in fruit; stamens 5, fused at base with 5 small glabrous truncate staminodes between the filaments; anthers 4-locular; stigma capitate; fruit 1-seeded.

Sericostachys scandens *Gilg & Lopr.*

A pilose or tomentose climbing shrub with ovate to elliptic leaves; inflorescence a large panicle of white spikes becoming feathery with the plumose sterile flowers in fruit.

An uncommon climber, only recorded from the western Kenya forests at Kakamega. It is very conspicuous in fruit, when it rather resembles *Clematis*. MUM.

Drummond and Hemsley 4751.

5. SERICOCOMOPSIS *Schinz*

Shrubs, usually densely hairy, with opposite leaves; inflorescence a raceme of dichasial cymes very similar to those of *Cyathula*, but without any sterile flowers subsequently involved in dispersal; any sterile flowers present result from arrested development within second order bracteoles; flower characters as in *Cyathula*.

1 Leaves ± spathulate, truncate at apex; hairs simple, bracts coriaceous, not membranous; bracteoles and sepals not plumose at tip 1. *S. hildebrandtii*

Leaves ± elliptical, narrowed at apex; hairs stellate; bracts thin, membranous and transparent; bracteoles and sepals plumose at tip 2. *S. pallida*

1. **Sericocomopsis hildebrandtii** *Schinz*

A much-branched canescent bushy shrub with obovate to spathulate leaves and terminal racemes of sessile cymes.

A common shrubby amaranth of dry thornbush country especially on fine soils. The white inflorescences serve to distinguish it from the following species which has grey inflorescences, and the absence of hooks on the cymes from *Cyathula* sp. *A.* with which it is often confused. NAR, BAR, RV, MAG, NAN, MAC, KAJ.

Agnew 7619; Glover 4048.

2. **Sericocomopsis pallida** (*S. Moore*) *Schinz*

A much-branched stellate-canescent bushy shrub with ovate-elliptic leaves and terminal racemes of well separated, pedunculate, alternate greyish cymes.

A common shrub of dry thorn bush on shallow, often calcareous, soils. BAR, KAJ.

Agnew 7623; Vesey Fitzgerald 260.

6. CENTEMOPSIS *Schinz*

Usually erect annual or perennial herbs with opposite narrow leaves; inflorescence a spike of sessile reduced cymes; cymes with 1–3 flowers, without sterile flowers, becoming woody at base in fruit; flowers bisexual; stamens fused at base; staminodes present, ciliate; anthers 4-locular; stigma simple; fruit 1-seeded.

Centemopsis rubra (*Lopr.*) *Schinz* (inc. records of *C. kirkii* (Hook. f.) Schinz in Check List) (see p. 138)

Erect sparsely pubescent annual or facultative short-lived perennial with linear sessile leaves and reddish spikes of 2-flowered cymes.

A common plant of dry grassland at lower altitudes in our area, in the East only. MAC, NBI, KAJ.

Bally B4179; Tweedie 67/72.

7. CYATHULA *Lour.*

Erect or scrambling herbs or shrubs, nearly always hairy; leaves opposite, entire, petiolate; inflorescences of racemes of cymes, the cymes always more than 3-flowered, but variously developed, the ultimate unit being a central fertile flower with 2 lateral sterile ones which may be variously modified into hooked bristles or spines; sepals lanceolate, not thickened in fruit; filaments connate below into a tube, bearing 5 staminodes, of various shapes; anthers 4-locular; stigma capitate; fruit 1-seeded.

A large genus in which many of the names applied here are probably wrong and require revision.

1 Hooked bristles present on inflorescences; perennials 3

Hooked bristles absent on inflorescences; annuals 2

2 Inflorescence a long raceme of sessile, globose cymes 1. *C. orthocantha*

Inflorescence a short raceme of pedunculate globose cymes, or globose cymes solitary 2. *C. erinacea*

3 Shrubs or erect herbs (rarely scramblers); inflorescence a long raceme of cymes, interrupted towards the base 4

An uncommon wild plant but often cultivated by small arable farmers for a green spinach, and possibly also for chicken-food. The cultivated form has fruits from 2–2·5 mm long, as opposed to 1·5–2 mm long in the naturalised form, and larger leaves and is apparently plucked for eating and left to grow. In that case the terminal inflorescence may be lost leaving only axillary glomerules which sometimes exceed 4 cm in diam. HM, KIT, RV.

Turner 3516; Kerfoot 2784.

3. Amaranthus hybridus *L.* (*A. hypochondriacus* L. in Check List)

An erect glabrous annual with rhombic cuneate leaves and terminal and axillary spike-like racemes.

The commonest *Amaranthus* in Upland Kenya, this ruderal is found between 4000 and 8000 ft in all cultivation. The inflorescence has a characteristic 'spiny' look in the common subspecies, *A. hybridus* ssp. *hybridus*.

1 Bracts and bracteoles 4–5 mm long, twice as long as perianth segments; cymes, often with 1–2 mm long internodes, becoming monochasial above ssp. *hybridus*
Bracts and bracteoles ± equal to the sepals; cymes with short internodes, not monochasial above ssp. *incurvatus*

ssp. hybridus

HC, HM, HA, HK, KIT, NAR, RV, NAN, MAC, NBI.

Strid 2570; Kerfoot 759.

ssp. incurvatus (*Gren. & Godr.*) *Brenan*

Rather rare, and very difficult to distinguish from *A. caudatus* on the one hand and *A. spinosus* (except for the absence of spines) on the other, so that the taxonomic position of these plants is a little doubtful. We have one sterile collection (rare in *Amaranthus* where seed is usually abundant) from the edge of our area at Mwingi (MAC) which may well be hybrid between this and *A. spinosus*. MUM.

Agnew and Musumba 8025.

4. Amaranthus caudatus *L.*

An erect glabrescent annual similar to *A. hybridus* except for the key characters.

There are but few specimens available of this species in Kenya, and this assessment may have to be altered as more are collected. The variety with a drooping, often brightly coloured (red) inflorescence, which may be rather thick at base and tapering throughout its length, has only been found at Kericho in a wild state, but is often cultivated. The variety with fewer, erect or spreading branches has been found at Embu. It may be cultivated as a leaf vegetable.

Graham 1726; Kerfoot 4719.

5. Amaranthus *sp.* **A.**

A glabrescent plant with prostrate or ascending sparsely pubescent stems and rhombic or elliptic leaves; flowers crowded in axillary cymes.

Only recorded once, from Ruiru; this plant should be searched for in that locality. HA.

James 2304.

6. Amaranthus graecizans *L.*

An erect or decumbent, sparsely pubescent annual with narrow-rhombic to elliptic leaves and axillary cymes of small green flowers.

A common plant of fields and disturbed places at medium altitudes in our area. HM, HA, KIT, NAR, BAR, RV, EMB, MAC, NBI, KAJ.

Kerfoot 2869; Agnew 7589.

7. Amaranthus acutilobus *Uline & Bray*

A glabrous erect annual or creeping perennial with elliptic to ovate leaves and axillary glomerules of flowers.

A recent arrival, apparently, in Nairobi, growing amongst lawn grass near Karura Forest; originally from Mexico. It should grow much larger than the specimens described here, which are all that have been found as yet. NBI.

Hughes-Rice in EAH 13377.

8. Amaranthus sparganiocephalus *Thell.*

Glabrous or glabrescent annual with ovate leaves and axillary glomerules of flowers.

A rare annual found in drier country, this plant has only once been recorded from our area, in Amboseli. KAJ.

Verdcourt 3127.

3. DIGERA *Forsk.*

Usually annual herbs with alternate leaves; inflorescence of simple spikes of sessile cymes, each cyme consisting of a central fertile bisexual flower with two accessory sterile flowers in the axils of the bracteoles, which are at length modified for fruit dispersal; stamens 5, not or hardly fused at base, without staminodes; anthers 4-locular; stigma 2-lobed; fruit 1-seeded.

Digera muricata (*L.*) *Mart.*

An erect, glabrous (often very tall) annual, usually unbranched below, with linear to lanceolate leaves and long terminal spikes of cymes; sterile flowers of each cyme forming green coriaceous wings.

Pupalia lappacea *Juss.*

Annual or perennial, prostrate, scrambling or erect herb with elliptic or ovate leaves; racemes terminal, erect or pendulous with well-spaced, alternate, shortly pedunculate cymes, elongating in fruit.

An annoying plant producing highly adhesive burrs which stick on all clothing, and make life difficult in dry country. It is very variable, and although there are clearly defined forms growing in dry bush country (prostrate annual with sepals 3·5–5 mm long and seeds 2 mm long) and evergreen woodland (scrambler with sepals 6–9 mm long and seeds 4 mm long) intermediates do occur. HA, MUM, NAR, RV, MAG, EMB, MAC, NBI, KAJ.

Agnew and Azavedo 9325; Kirrika 495.

9. DASYSPHAERA *Gilg*

Shrubs with opposite leaves; inflorescence a raceme of cymes; fertile flowers bisexual, each (except the central one of each dichasium) with a tuft of numerous bristles on either side in the axil of the bracteoles representing sterile flowers; stamens 5, the filaments fused at the base to form a tube (around the ovary) which is shortly free from the filaments above, but which bears no staminodal projections; anthers 4-locular; ovary 1-seeded, stigma capitate.

Dasysphaera prostrata (*Gilg*) *Cavaco*

A bristly-hairy suffruticose herb or shrub with lanceolate to triangular-cordate leaves and a loose terminal raceme of pedunculate cymes each forming a yellowish ball in fruit.

A somewhat rare plant found in alkaline areas. BAR, NAN, KAJ.

Agnew 7641; Verdcourt 2555.

10. AERVA *Forsk.*

Usually woolly shrubs or herbs with alternate and sometimes opposite simple leaves; inflorescence a raceme of alternately arranged cymes, breaking within the cyme in fruit, or flowers directly inserted on the axis of a spike, not in cymose groups; bracts, bracteoles and sepals ± scarious with long woolly hairs giving a felty appearance to the whole inflorescence; flowers bisexual; stamens 5, shortly fused at base, or free; anthers with 4 loculi; staminodes present, entire; stigma 2-lobed; fruit 1-seeded.

1	Inflorescence terminal	1. *A. persica*
	Inflorescences all axillary	2. *A. lanata*

1. Aerva persica (*Burm. f.*) *Merrill*

A woolly erect perennial herb, sometimes suffruticose, with sessile lanceolate-elliptic leaves and a white terminal panicle of racemes.

A common plant of the driest thorn-bushland on finer soils. BAR, MAG.

Harmsen 6475; Glover 2986.

2. Aerva lanata (*L.*) *Juss.*

Erect or trailing herb with usually rather few branches, lower leaves often opposite, the upper always alternate; leaves spathulate to obovate to elliptic; spikes axillary, 1–3 together, very variable, of crowded white-woolly flowers.

A common weed species of many open habitats in dry country at medium altitudes, although not found in the drier thorn-bushland. It is very variable but easily recognized. HM, HA, HK, HN, KIT, MUM, KIS, RV, NAN, EMB, MAC, NBI, KAJ.

Glover 482; Strid 2612.

11. NOTHOSAERVA *Wight*

Herbs with alternate leaves; inflorescence a spike of sessile single flowers, the spikes axillary; bracts and sepals membranous, scarious; stamens 1–2, without a filament tube at base, anthers 4-locular; ovary with very short style and simple stigma; fruit 1-seeded.

Nothosaerva brachiata (*L.*) *Wight*

An erect glabrous annual, with elliptic leaves and axillary spikes of white or cream woolly flowers.

An inconspicuous rare annual, growing in seasonally wet, possibly alkaline, hollows in dry areas. BAR.

Bogdan 4890.

12. PSILOTRICHUM *Blume*

Herbs or shrubs, hairy or glabrous with opposite, entire leaves; inflorescences axillary or terminal, of simple or panicled spikes of solitary flowers, without accessory sterile flowers; flowers bisexual; sepals 5, green, not scarious; stamens 5, the filaments united below, without staminodes, or with very short glabrous teeth between the filaments, anthers 4-locular; fruiting flower not reflexed, falling entire; stigma capitate; fruit 1-seeded.

1	Annual; leaves linear; spikes terminal and axillary	1. *Ps. schimperi*
	Perennials; leaves broader; spikes axillary only	2. *Ps. elliottii*

1. Psilotrichum schimperi *Baker*

A sparsely stiff-hairy, erect annual, with opposite or alternate, linear, stiffly ciliate leaves and terminal spikes of glabrous flowers.

An oddly local plant, often found in the Nairobi National Park, but infrequently elsewhere. MUM, NBI.

Davidson 346; Agnew 5517.

Scrambling or prostrate (rarely erect) herbs or shrubs; inflorescence a short or long continuous raceme of cymes, never interrupted 5

4 Erect herb; leaves cordate or rounded at base; racemes usually over 10 cm long 3. *C. schimperana*

Shrub; leaves abruptly cuneate at base; inflorescences usually less than 10 cm long 4. *C.* sp. *A*

5 Racemes globose, densely covered with yellow hooked bristles 5. *C. uncinulata*

Racemes cylindrical, with few hooks 6

6 Leaves mostly rounded at base; racemes grey-silvery, terminal, solitary, without divaricating branches bearing subsidiary racemes 6. *C. cylindrica*

Leaves mostly cuneate at base; racemes golden-yellow, terminal and with subsidiary racemes on widely divaricate branches 7. *C. mannii*

1. Cyathula orthocantha (*Asch.*) *Schinz*

An erect pubescent to tomentose annual with ovate-elliptic or orbicular leaves and pedunculate terminal racemes of almost sessile cymes.

An uncommon annual of disturbed drier areas, often in *Acacia* bushland. KIS, BAR, MAG, NAN, KAJ.

Hanid and Kiniaruh 737; Bogdan 393.

2. Cyathula erinacea *Schinz*

Erect or trailing, sparsely pilose annual with ovate-lanceolate leaves and terminal short racemes of globose pedunculate heads of crowded cymes, ripening into spherical balls with straw-yellow spines appearing out of the felty tomentum.

An uncommon annual found in dry rocky bushland. The yellow fruiting heads are conspicuous and the stems are often reddish. MAG, KAJ.

Agnew 7643; Glover 2997.

3. Cyathula schimperana *Moq.* (*C. polycephala* Bak. in Check List)

A tomentose or woolly herb, with ascending or erect stems and ovate-elliptic, cordate or rounded leaves; inflorescence terminal, leafless, of crowded pedunculate cymes which are spaced out so that each may develop into a separate globose straw-coloured mass.

A common weed of upland grassland, especially where woodland has been recently cleared, 5000–9000 ft. A curious feature is that the flowers are either found with shrivelled, apparently empty anthers on short (about 1 mm) filaments, or with full anthers on 3 mm long filaments. It would be interesting to know whether this was a constant feature of all populations helping cross-polination. HT, HM, HA, HK, MAC, NBI, KAJ.

Agnew 7541; Morley-Hewitt 1389.

4. Cyathula *sp.* **A.**

A small pubescent to tomentose shrub with ovate-elliptic leaves and terminal pedunculate interrupted white-glossy racemes.

A common bushy plant of rocky scarps and cliffs in dry country, especially abundant in the Rift Valley. HA, NAR, RV, MAG, MAC.

Agnew 7156; Nattrass 587.

5. Cyathula uncinulata (*Schrad.*) *Schinz.*

A softly tomentose prostrate or climbing herb or soft shrub (climbing by means of kneed petioles) with lanceolate to almost orbicular leaves; inflorescence a terminal condensed raceme forming a straw-coloured ball in fruit.

A rather variable species as defined here, and further work may allow separation between forms. It is found in medium-wet forest and forest edges, 4000 to 8000 ft. HE, HC, HM, HA, HK, KIT, NAR, MAC, NBI.

Kokwaro 227; Agnew *et al.* 8407.

6. Cyathula cylindrica *Moq.*

A pilose or tomentose scrambling perennial herb with lanceolate to ovate leaves and solitary terminal, cylindrical, uninterrupted, silvery-grey to hardly straw-coloured spikes.

Rather uncommon in the wetter high-level forests, 7500 to 10 000 ft; this trailer with its (usually) hanging silvery racemes is unmistakable. HE, HM, HA, HK.

Agnew 7163; Kerfoot 3861.

7. Cyathula mannii *Bak.*

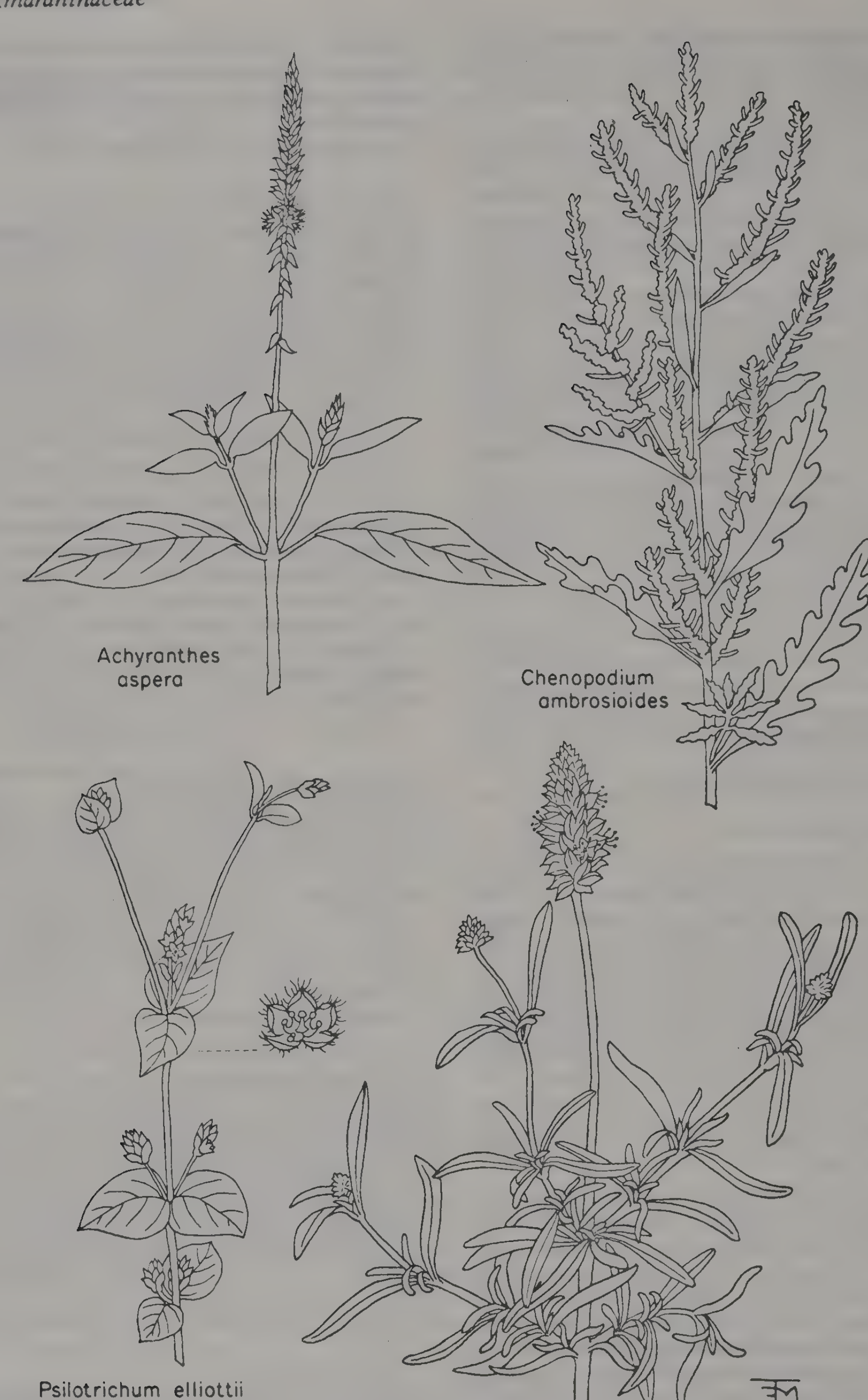
A sparsely hairy scrambling or trailing perennial with elliptic leaves and short straw-coloured cylindrical uninterrupted spikes.

A common scrambler of the forest edge in regions of medium rainfall at medium altitudes, 5000–8000 ft; in fact this is usually the region of evergreen woodland. HM, HA, HK, NAR, RV, NBI, KAJ.

Glover 2265; Hanid 301.

8. PUPALIA *Juss.*

A genus very similar to *Cyathula* from which it differs in having alternately arranged cymes in the raceme, more highly developed sterile flowers of stellate hooks in fruit and no staminodes.


Achyranthes
aspera
Chenopodium
ambrosioides
Psilotrichum elliottii
Centemopsis rubra

2. Psilotrichum elliottii *Baker* (see p. 138)

Pilose to tomentose perennial shrub or scrambler with ovate to orbicular leaves and axillary simple spikes of imbricate green flowers.

A common plant of open bushland in the MAC area. It is rather variable and may grow as a bush or scrambler and be woolly or almost glabrous. NAR, MAC.

Agnew, Hanid, and Kiniaruh 9247; Glover 2030.

13. ACHYRANTHES *L.*

Herbs or shrubs similar to *Psilotrichum* but with staminodes and reflexed fruiting flowers.

1 Bracts, bracteoles and sepals shiny and glabrous in flower except for ciliate edges; flowers deflexed parallel to stem in fruit — 1. *A. aspera*
Bracts, bracteoles and sepals woolly; flowers only partially deflexed in fruit to lie at 45° to the stem — 2. *A. schinzii*

1. Achyranthes aspera *L.* (see p. 138)

An annual or perennial, tomentose or pubescent herb or shrub with ovate-obtuse to lanceolate-acute leaves and long spikes of reddish flowers.

A most variable plant which cannot yet be broken down satisfactorily to smaller, more ecologically natural units. The var. *aspera* has larger flowers (more than 5·5 mm long) and the bract longer than the bracteole and grows as a shrub along forest edges and waste places. The var. *sicula* has smaller flowers (less than 5 mm long) and the bract shorter than the bracteole and grows west of the Rift Valley at forest edges; it has an annual form which is a field weed. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, NAR, BAR, RV, EMB, MAC, NBI, KAJ.

Agnew 8046 · Kerfoot 3503.

2. Achyranthes schinzii (*Standl.*) *Cuf.*

A tomentose woody scrambler with lanceolate leaves; spikes as in *A. aspera* but flowers set closer together.

A rare plant, only so far found in NAR, MAC, and NBI, in riverine woodland.

Verdcourt 3804; Agnew 10892.

14. ACHYROPSIS (*Moq.*) *Hook. f.*

A genus very similar to *Psilotrichum* from which it differs in the hard, shiny texture of the sepals and the long, ciliate staminodes.

Achyropsis greenwayii *Suessenguth*

A more or less canescent bushy shrub with lanceolate elliptic leaves and terminal green spikes.

A common shrub of dry grassland on black-cotton soil, in southern Kenya only. HA, NAR, MAC, NBI, KAJ.

Agnew and Musumba 5327; Verdcourt 1505.

15. ALTERNANTHERA *Forsk.*

Herbs, often prostrate, with opposite entire leaves; inflorescences of axillary spikes; flowers borne directly on the spike, not in dichasial cymes; sepals 5, sometimes hardened in fruit; stamens 5, with 2-locular anthers, fused into a ring at the base of the filaments, with staminodes (sometimes obscure); style short; stigma unlobed; ovary 1-seeded, globose or flattened, indehiscent.

1 Stems glabrous or with 2 lines of hairs only; calyx soft not spiny in fruit — 1. *A. sessilis*
Stem hairy all round; fruiting calyx hard and spiny — 2
2 Glochidiate hairs only on inner pairs of fruiting calyx segments (rarely small tufts at base of outer segments) never showing between bracts of spike — 2. *A. pungens*
Glochidiate hairs on all members of fruiting calyx, showing as 'wool' between bracts of spike — 3. *A. peploides*

1. Alternanthera sessilis (*L.*) *DC.*

A low herb, rooting at the nodes with ascending stems and oblanceolate to elliptic leaves; spikes axillary, globose or short-cylindrical, white.

Rather common in or near water in the hotter parts of our area. KIT, MUM, KIS, MAG, EMB, MAC, NBI.

Agnew 8013; Symes 342.

2. Alternanthera pungens *H. B. K.*

An annual herb with prostrate hairy stems from a thick ± fleshy taproot, and obovate-elliptic leaves; spikes sessile, straw-coloured.

A common unpleasant introduced weed of paths and roadsides, with spiny fruits. Found all over our area except in the wet highland forests. HT, HM, HA, KIS, NAR, BAR, MAC, NBI, KAJ.

Hanid and Kiniaruh 758; Glover 2020.

3. Alternanthera peploides (*H. & B.*) *Urban*

Similar to *A. pungens* but with smaller spikes and the differences mentioned in the key.

This species is also introduced from Central America, and is found in waste places, so far only in Nairobi and Thika. MAC, NBI.

Tweedie 66/60; Faden 67750.

16. GOMPHRENA *L.*

Herbs with erect or ascending stems; leaves opposite; inflorescence a terminal or lateral spike of imbricate flowers with keeled bracteoles; sepals

rarely in cymes, regular or rarely zygomorphic, bisexual, pentamerous or rarely tetramerous; sepals and petals free, usually imbricate; stamens usually twice the petal number, more rarely the same or three times the number; ovary 4-5-locular, each loculus with 2 or more axile ovules, or very rarely 1 ovule per loculus or per fruit by abortion; style usually short or stigmas sessile; fruit a schizocarpous capsule or rarely a berry; seeds mostly endospermous with straight or slightly curved embryo.

1 Leaves simple, equal in each pair; stipules modified into 2 long and 2 short spines 1. *Fagonia*
Leaves pinnate, one of each pair longer than the other; stipules foliaceous 2. *Tribulus*

1. FAGONIA *L.*

Perennial herbs or small shrubs with opposite, often divided leaves, with stipules (in ours) modified into two long and two short spines at each node; flowers solitary, axillary, pentamerous; sepals membranous, imbricate, deciduous; petals longer than sepals, imbricate, vaducous, clawed, usually pink, red or purple; stamens 10; ovary 5-celled, with 5-angled style and simple stigma; ovules 2 per loculus; fruit an almost globular or pyramidal loculicidal capsule with furrows between the carpels; seeds compressed, mucilaginous.

Fagonia *sp.* **A.**

An erect, sparsely glandular, much branched woody herb with narrowly elliptic to narrowly oblanceolate leaves and solitary pink flowers.

A plant of hard diatomaceous lake beds or hard pans in dry areas where rainwater collects. It is recorded from Ol Orgesailie and Magadi only. MAG.

Lind 5576; Verdcourt 3711.

2. TRIBULUS *L.*

Annual or perennial herbs, very rarely shrubs, with prostrate or ascending branches; leaves opposite, paripinnate, one in each pair usually longer than the other, stipulate; leaflets opposite, sessile or very shortly petiolate, entire and somewhat oblique; stipules herbaceous; flowers solitary, axillary or in the dichotomies of the stem, pentamerous; sepals deciduous or sometimes persistent; petals (in ours) yellow, longer than sepals, spreading; stamens 10, those opposite the sepals with a gland at the base of each filament; ovary sessile, 5-lobed, each loculus with 1-5 ovules, densely covered with stiff erect hairs; stigmas 5; fruit hard, woody, each carpel dorsally tuberculate and armed with spines (in ours), schizocarpic; seeds without endosperm.

1 Peduncles usually shorter than or the same length as the subtending leaf; flowers up to about 17 mm in diameter; staminal glands free; style almost absent 1. *T. terrestris*
Peduncles usually longer than the subtending leaf; flowers more than 17 mm in diameter; staminal glands connate and forming a shallow cup around base of ovary; style ± elongated 2. *T. cistoides*

1. Tribulus terrestris *L.* (see p. 145)

An often pubescent annual herb with prostrate branches and unequal leaves bearing 4-7 oblong to oblong-lanceolate leaflets; fruit globose in outline, each of the 5 mericarps having a pair of diverging bony spines in the upper part and 2 smaller ones in the lower.

A widespread ruderal growing on sandy soils, waste ground, near human habitation, and a troublesome weed of roadsides and cultivated land. HE, KIS, NAR, BAR, RV, NBI, KAJ.

Hanid and Kiniaruh 749; Glover, Gwynne, and Samuel 220.

2. Tribulus cistoides *L.*

Procumbent perennial, or rarely annual, herb similar to *T. terrestris* except for the key characters and the mericarps of the fruit, each of which has 4 or rarely 6 spines (sometimes reduced to thick warts) and a laterally compressed dorsal crest.

A weed of sandy soils recorded only from Kerio Valley, apparently overlooked and badly in need of more collection of flowering and fruiting material. BAR.

Brown in EAH 12805.

32. GERANIACEAE†

Herbs or shrubs, rarely arborescent; leaves alternate or opposite, stipulate, lobed or compound, rarely entire; inflorescences cymose or umbellate; flowers usually bisexual, generally 5-merous (occasionally 4- or 8-merous); calyx free or connate at the base, sometimes spurred; corolla free and usually unequal, imbricate, rarely contorted; stamens somewhat connate at the base, some occasionally sterile; disk glands often present; ovary superior, syncarpous, 3-5-locular with axile placentation, each chamber with 1-2 seeds; fruit schizocarpic.

1 Stamens 15 2. *Monsonia*
Stamens 10 2
2 Flowers regular; sepals unspurred; anthers 10 1. *Geranium*

† By J. O. Kokwaro.

5, equal; stamens 5, with 2-celled anthers sessile on the long filament tube; staminodes absent; style bifid; ovules 1; fruit indehiscent.

Gomphrena celosioides *Mart.*

A pilose perennial herb with prostrate or ascending branches and obovate to elliptic leaves; spikes terminal, pedunculate, white.

A common weed of roadsides and pathsides. HT, KIT, MUM, KIS, EMB, MAC, NBI, KAJ.

Agnew 7596; Boardman 10.

29. BASELLACEAE†

Twining climbers with alternate, ± fleshy, entire, exstipulate leaves; flowers bisexual, in spikes, racemes or panicles; bracteoles present, 2; sepals 5, free or united; petals absent; stamens 5, with free filaments, and porose or longitudinal dehiscence of the anthers; ovary superior, with one basal ovule and 3 stigmas; fruit indehiscent, surrounded by the calyx and often the bracteoles; seed with curved embryo and much endosperm.

1. BASELLA *L.*

Glabrous herbs with ovate, slightly fleshy leaves; flowers sessile, in spikes; bracteoles united to the sepals; sepals fused forming a fleshy tube with stamens inserted near the top; stamens with longitudinal dehiscence; ovary with 3 long filamentous stigmas on a short style.

Basella alba *L.* (see p. 148)

A glabrous climbing shrub with glossy, ovate-orbicular, cordate leaves and short spikes of white flowers.

A common species found in riverine forest at all altitudes from 7000 ft downwards. HE, HA, HK, KIT, RV, EMB, MAC, NBI.

Agnew 7747; Kabuye 46.

30. LINACEAE‡

Herbs, shrubs, lianes, or trees with simple, mostly stipulate, alternate or opposite leaves; stipules divided or entire, gland-like or interpetiolar; inflorescence mostly a terminal or axillary cyme; flowers regular, bisexual; sepals 4–5, free or connate below, imbricate, persistent; petals as sepal number, free or connate below, usually fugacious, contorted in bud, often clawed; stamens mostly as sepal number, sometimes staminodes present, filaments connate at the base; ovary superior, 3–5-celled, with 2 axile and pendulous ovules per loculus; fruit a septicidal capsule or drupe; seeds compressed, with or without endosperm.

† By A. D. Q. Agnew.
‡ By M. A. Hanid.

1. LINUM *L.*

Annual or perennial herbs, glabrous (in ours), often woody at the base; leaves sessile, alternate or whorled (in ours), with entire or shortly denticulate margin; stipules absent or glandular; inflorescence a terminal monochasial or dichasial cyme (in ours); sepals free; petals yellow or orange-yellow (in ours), shortly clawed; stamens alternating with petals; each loculus of ovary partly divided by a false septum; fruit 4–5-locular with valves twice the loculus number and 1 seed per loculus; seeds smooth, with scanty or no endosperm.

1 Leaves in whorls of 3 or 4 ... 1. *L. keniense*
Leaves alternate ... 2
2 Leaves with a pair of dark brown stipules, one on either side of base ... 2. *L. volkensii*
Leaves exstipulate ... 3. *L. usitatissimum*

1. Linum keniense *T. C. E. Fries*

Prostrate or decumbent perennial herb with whorled, broadly elliptic to ovate leaves and terminal few-flowered dichasial cymes of tetramerous yellow flowers.

This rare species is our only tetramerous *Linum*. It is recorded from pathsides and edges of upland forests, possibly near streams. HE, HM, KIT.

Webster in EAH 10001; Glover, Gwynne, and Samuel 1462.

2. Linum volkensii *Engl.* (see p. 145)

Erect, sparsely branched annual with alternate linear-lanceolate leaves and a terminal loose corymbose cyme of pentamerous yellow flowers.

A common *Linum* of upland grasslands, often by streams and in marshes. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, RV, NAN, MAC, NBI, KAJ.

Hanid 234; Verdcourt 2256a.

3. Linum usitatissimum *L.*

An erect annual with alternate linear-lanceolate leaves and a terminal corymbose cyme of pentamerous blue or white flowers.

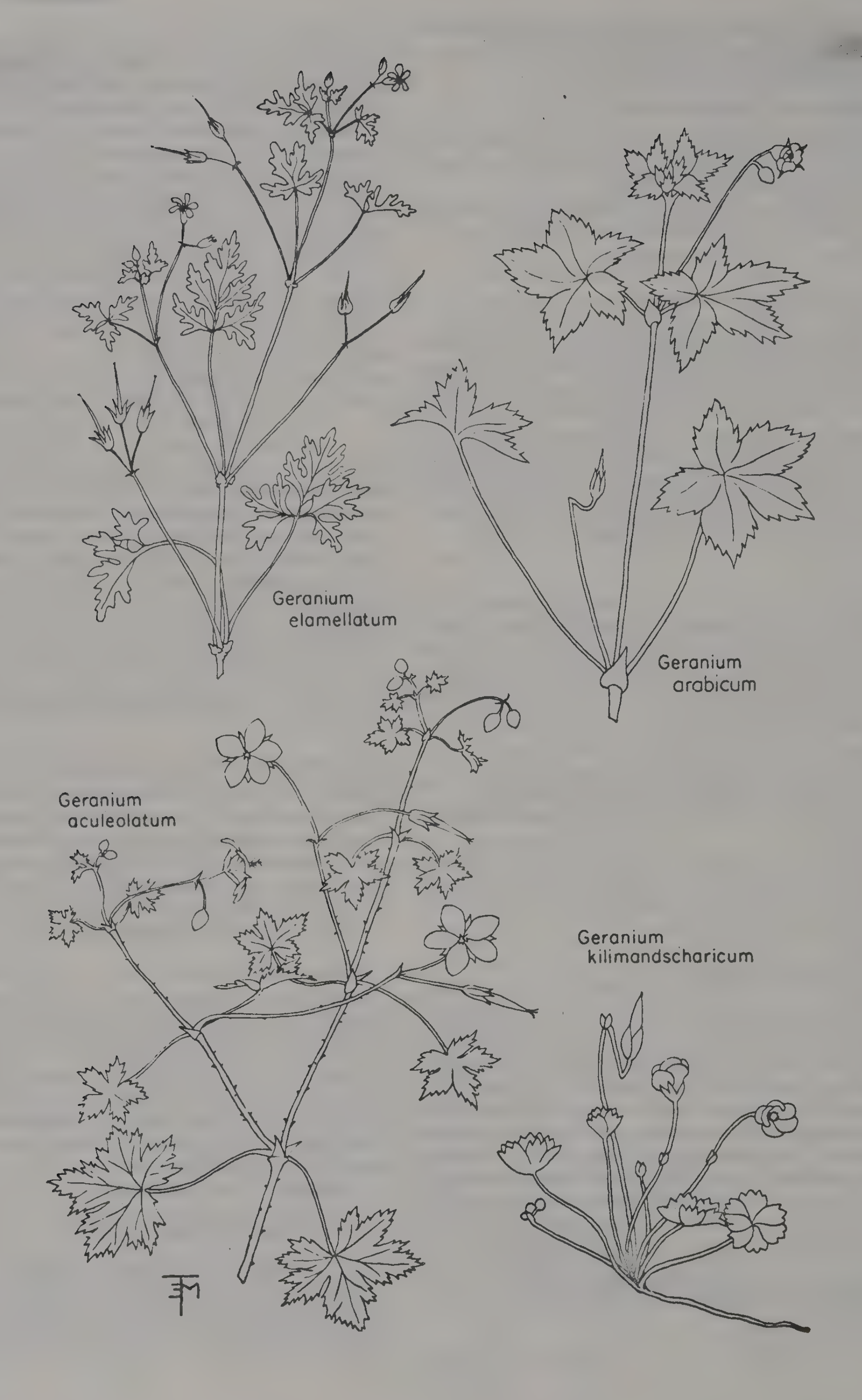
An introduced flax of waste places and abandoned cultivated ground. It is widely cultivated for its fibre and oily seeds and is easily recognized by its normally blue flowers and large capsules. KIT, EMB, NBI.

Bogdan 5710; Nattrass 318.

31. ZYGOPHYLLACEAE§

Herbs, shrubs, or undershrubs, rarely trees, with simple hairs; leaves opposite or alternate, usually pinnate or divided, stipulate; flowers solitary or

§ By M. A. Hanid.


Geranium elamellatum
Geranium arabicum
Geranium aculeolatum
Geranium kilimandscharicum

Flowers zygomorphic; posterior sepal spurred (and fused to pedicel); anthers 2–7
3. *Pelargonium*

1. GERANIUM *L.*

Annual or perennial herbs, sometimes tufted or woody below, with mostly opposite, palmately lobed or dissected leaves; flowers solitary or in axillary pairs or in a dichasium; calyx of 5 equal sepals; corolla of 5 mostly notched petals; stamens 10, all fertile; carpel beaks rolling upwards when ripe.

1 Stems armed with sharp prickles — 1. *G. aculeolatum*
Stems without prickles — 2
2 Lamina reniform in outline — 2. *G. kilimandscharicum*
Lamina pentagonal in outline — 3
3 Stipules less than 2 mm wide — 3. *G. elamellatum*
Stipules more than 2 mm wide — 4
4 Annual, with some cleistogamous flowers — 4. *G. ocellatum*
Perennial, without cleistogamous flowers — 5
5 Stipules bifid; pedicels glandular — 5. *G. vagans*
Stipules undivided; pedicels without glands — 6. *G. arabicum*

1. Geranium aculeolatum *Oliv.* (see p. 142)

A perennial trailing herb rooting at the nodes with sharp reflexed prickles and palmately lobed leaves; flowers mostly in pairs, white or mauve; mericarps smooth or pilose.

Found in montane forests and moist places such as river banks and marshy sides of valleys, also as a weed in cultivation above 8000 ft.

Napier 702; Agnew 7730.

2. Geranium kilimandscharicum *Engl.* (see p. 142)

A perennial prostrate stoloniferous herb, sometimes woody at base; leaves opposite but the basal ones sometimes in a rosette, frequently pink-red on the lower surface; flowers mostly solitary, pink-red to light pink; mericarps pilose.

Restricted to alpine belts of the high mountains at altitudes usually above 10 000 ft. HE, HA, HK.

Hedberg 1863; Hanid 162.

3. Geranium elamellatum *Kokwaro* (see p. 142)

A decumbent or erect glandular pubescent annual herb, with weak and hollow stems; leaves ovate, pinnatisect, sometimes alternate below; flowers pale lilac, mauve, or pink; mericarps wrinkled and usually with a raphe at the anterior end.

A rare herb confined to forest edges and moist shady areas of the montane forest belt. MUM, HE, HT, HA, HK.

Albrechtsen 2763; Agnew 10127.

4. Geranium ocellatum *Cambess.* (see p. 143)

An ascending, diffusely branched annual herb, with spreading hairs or glands; leaves orbicular palmatisect; flowers in pairs, chasmogamous and some cleistogamous, pink with dark almost black-purple centre; mericarps with shallow reticulate ridges.

Generally found in shade such as in caves or along the hillslopes and forest edges, also as a weed in cultivation. HE, HT, KIT, RV.

Bally B 918; Ables 122.

5. Geranium vagans *Bak.*

A perennial, decumbent, pilose to glandular herb, with orbicular palmatisect leaves alternate below and opposite above; sepals red or greenish, petals pink or mauve; mericarps pilose.

Found in grassland or montane forest belt and also in the alpine belt, usually along streambanks. HE, HA, HK.

Hedberg 844; Agnew 7208.

6. Geranium arabicum *Forsk.* (see p. 143)

A stoloniferous perennial herb, pilose or pubescent above to glabrescent below; leaves orbicular, palmatisect, opposite, ocasionally in basal rosettes; flowers white or purple with conspicuous red veins; mericarps pilose.

A widely distributed species found in the grassland region and the montane forest extending into the alpine belt. HE, HT, HA, HK.

Dowson 106; Agnew 7187.

2. MONSONIA *L.*

Annual or perennial, erect or decumbent herbs with dentate or crenate, sometimes lobed leaves; stipules filiform to subulate or rarely spinescent; flowers usually 2-several per peduncle, rarely solitary, mostly pentamerous and regular; stamens 15, all fertile; carpel beaks twisting spirally when ripe.

1 Petals 7–12 mm long; annual herbs — 1. *M. angustifolia*
Petals 14–26 mm long; perennial herbs — 2
2 Lamina hastate or trilobed; anthers 1·6–2 mm long — 2. *M. longipes*
Lamina lanceolate to ovate; anthers 2–2·5 mm long — 3. *M. ovata*

1. Monsonia angustifolia *A. Rich.* (see p. 143)

An annual decumbent or erect herb with opposite or semi-opposite, narrowly oblong leaves; flowers 2–3 per peduncle; petals slightly longer than the sepals, mauve or white.

In open woodland or wet grassland or more frequently as a weed in cultivated land. HE, KIT, HA, RV, MAC, KAJ.
Thorold 3203; Agnew and Musumba 5307.

2. Monsonia longipes *R. Knuth* (see p. 145)
A hairy, decumbent, profusely branched perennial herb with mostly opposite hastate leaves; peduncles usually 1–5-flowered; petals bright yellow or lemon but sometimes white.
Found in grassland or semi-seasonal swamps, particularly on sandy-loam hillsides. RV, NBI.
Verdcourt 3262; Ables 16.

3. Monsonia ovata *Cav.* (*M. glauca* Knuth)
Erect perennial herb with ± woody base and fleshy roots; leaves opposite to sub-opposite, narrowly lanceolate to ovate; flowers usually in pairs, white or lemon.
Can be found in open *Acacia* plains or wooded grassland on sandy or stony soils. RV, MAG, MAC.
Verdcourt and Napper 2171.

3. PELARGONIUM *Ait.*
Annual or perennial herbs or shrubs, sometimes with tuberous roots, erect or decumbent and sometimes acaulescent; leaves rarely entire, usually lobed to variously dissected or compound; flowers 2-many per peduncle, mostly pentamerous and zygomorphic; stamens 10, only 2–7 fertile; disk glands absent; carpel beak twisting spirally when ripe.

1	Leaves pinnate or 3-partite to 3-foliolata with terminal lobe or leaflet larger	1. *P. whytei*
	Leaves almost entire to 3–5(–7)-palmatilobed with ± equal lobes	2
2	Petals 4	2. *P. glechomoides*
	Petals 5	3
3	Petals greenish-yellow; lamina hastate	3. *P. quinquelobatum*
	Petals white, pink or red; lamina cordate	4. *P. alchemilloides*

1. Pelargonium whytei *Bak.*
A pubescent to almost glabrous, decumbent (occasionally tufted) perennial herb, with orbicular, variously dissected opposite leaves; flowers 2–5 per peduncle; petals 4, pink with red veins, antheriferous filaments 7.
Found in drier parts of the montane forest belt and the ericaceous belts, also in grassland regions. HE, HM, HN, RV, KAJ.
Rogers 260; Agnew *et al.* 10471.

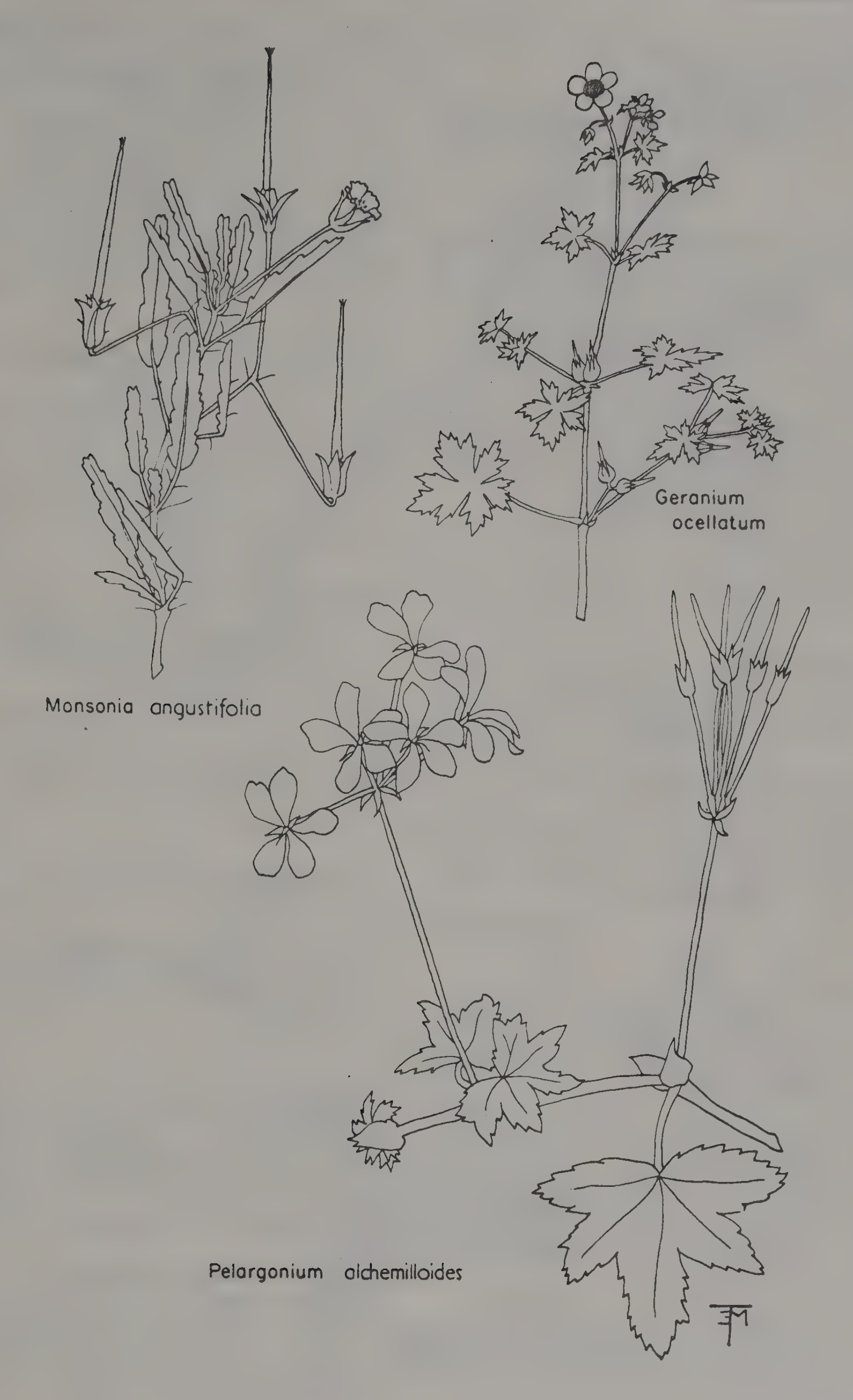
2. Pelargonium glechomoides *A. Rich.*
A pubescent and glandular, rhizomatous ascending perennial herb with opposite and/or alternate ovate pinnatisect leaves; flowers 2–8 per peduncle; petals 4, pink or rose-red with crimson lines; antheriferous filaments 5.
A rare species in our area, found on cliffs and lava rock edges, usually under the shade of hill slopes or river banks. MAC.
Napier 18.

3. Pelargonium quinquelobatum *A. Rich.* (see p. 145)
A short-stemmed pubescent perennial herb with straggling branches and a tuberous root; leaves in basal rosettes on main stem, opposite or alternate on branches, orbicular, 3–5-lobed; flowers (2–)4–8 per peduncle; petals 5, greenish-yellow to pale-lemon; antheriferous filaments 7.
May be found as a farm weed, but commoner in the rocky soils of lava flows or especially in evergreen woodland edges. RV, NBI, KAJ.
Gillett 13467; Strid 2577.

4. Pelargonium alchemilloides (*L.*) *Ait.* (*P. multibracteatum* A. Rich.) (see p. 143)
A perennial pubescent herb with a slightly tuberous rootstock; leaves alternate below and opposite towards the apex, orbicular, 5–7-lobed; flowers (5–)7–16 per peduncle; petals 5, white but sometimes pink or dark red; antheriferous filaments 5 or 7.
Found along slopes of hills and mountains in grassland and savannah woodland, also extending into montane forest edges. HE, KIT, RV, NAN, MAC, NBI, KAJ.
Verdcourt 2769; Agnew 9452.

33. OXALIDACEAE†
Annual or perennial herbs (in ours); leaves basically alternate, exstipulate or stipulate, digitately or pinnately compound; flowers regular, pentamerous, bisexual, in axillary cymes, pseudo-umbels or solitary; sepals free; petals free or falsely connate near the base; stamens in two whorls; filaments fused at the base to form a tube, with alternate short (outer) filaments opposite the petals and long (inner) filaments opposite the sepals; anthers 2-celled, versatile, opening inwards; ovary 5-celled, styles 5, with 1 to many axile ovules in each loculus; fruit a capsule, often

† By C. H. S. Kabuye.


Geranium ocellatum
Monsonia angustifolia
Pelargonium alchemilloides

explosively dehiscent; seeds with a fleshy endosperm or non-endospermous.

1 Leaves digitately 3-foliolate 1. *Oxalis*
Leaves pinnate and usually sensitive to touch 2. *Biophytum*

1. OXALIS *L.*

Caulescent or acaulescent, annual or perennial herbs, bulbous or not; leaves trifoliolate, rather sensitive to light (leaflets drooping during its absence), petiolate with membranous stipules adnate to the petiole or without stipules; flowers pedicellate, subtended by bracts in pseudo-umbels, cymes or solitary, usually trimorphic heterostylous (largely homostylous in *O. corniculata*); sepals sometimes with apical thickenings; stigmas 5, free, capitate; seeds covered by a white fleshy aril which bursts elastically by contraction, expelling the seed when ripe.

1 Plants with branching stems, not bulbous; flowers yellow 2
Plants bulbous; flowers pink to purple 3
2 Adnate stipules present at the base of petiole 1. *O. corniculata*
Stipules absent 2. *O. radicosa*
3 Vertical rhizome absent, the bulbs at or just below the soil surface with leaves and peduncles arising directly from them 5. *O. latifolia*
Vertical rhizome present, the bulbs at some depth below soil surface 4
4 Flowers solitary; lateral leaflets with 2-3 similarly large veins 3. *O. obliquifolia*
Flowers apparently in umbels; lateral leaflets with a well-marked midrib 4. *O. anthelmintica*

1. **Oxalis corniculata** *L.* (see p. 147)

Annual or perennial much-branched herb with stems creeping, ascending and frequently rooting at the nodes; flowers yellow in 1-6-flowered pseudo-umbels or solitary.

A common weed of cultivation, disturbed ground, lawns and roadsides, which is also found in some subalpine grassland.

This species is very variable in mode of growth, size and pubescence of its parts. There are forms with purplish and purple-variegated leaves. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, NBI, KAJ.

The following varieties occur in our area:

var. *corniculata.* Stems creeping and ascending, leaflets up to over 15 mm long and 20 mm wide, usually thinly punctulate only beneath; capsule mostly much over 5 mm long.

Weed in cultivation, disturbed ground, lawns and roadsides.

Agnew, Hanid, and Kiniaruh 7870; Kerfoot 3919.

var. *repens* (Thumb.) Zucc. Stems creeping, prostrate, rooting almost at every node; leaflets very small up to 4 mm long and 5 mm wide, thickly punctulate on both sides; capsules almost globose, very short, rarely longer than 3-4 mm. Found in forest glades and moorlands.

Lind, Agnew, and Woodley 5757; Napier 713.

2. **Oxalis radicosa** *A. Rich.* (*O. stricta non* L.) (see p. 147)

A perennial herb with usually thin stems arising from a thick main rootstock; corolla usually appearing pinkish in bud.

Found in forest clearings, mountain slopes, weed in cultivation and roadsides. HT, HM, KIT.

Tweedie 66/94; Kokwaro 78.

3. **Oxalis obliquifolia** *A. Rich.* (see p. 147)

A bulbous herb with a vertical rhizome bearing a basal bulb and an apical rosette of leaves; flowers solitary on erect peduncles; petals pink or purple, sometimes with a yellowish base.

Found in shallow soils and grasslands at medium altitudes and occasionally as a weed of cultivation and roadsides, between 2500 and 9500 ft. HT, HM, KIT, KIS, BAR, NBI.

Ables 9; Rogers 201.

4. **Oxalis anthelmintica** *A. Rich.* (see p. 148)

Similar to *O. obliquifolia* but with the differences given in the key.

Occasional weed in grassland and edges of riverine forest, on sandy loam, appearing after rains, 2500-6500 ft. HE, HC, KIT, NBI, KAJ.

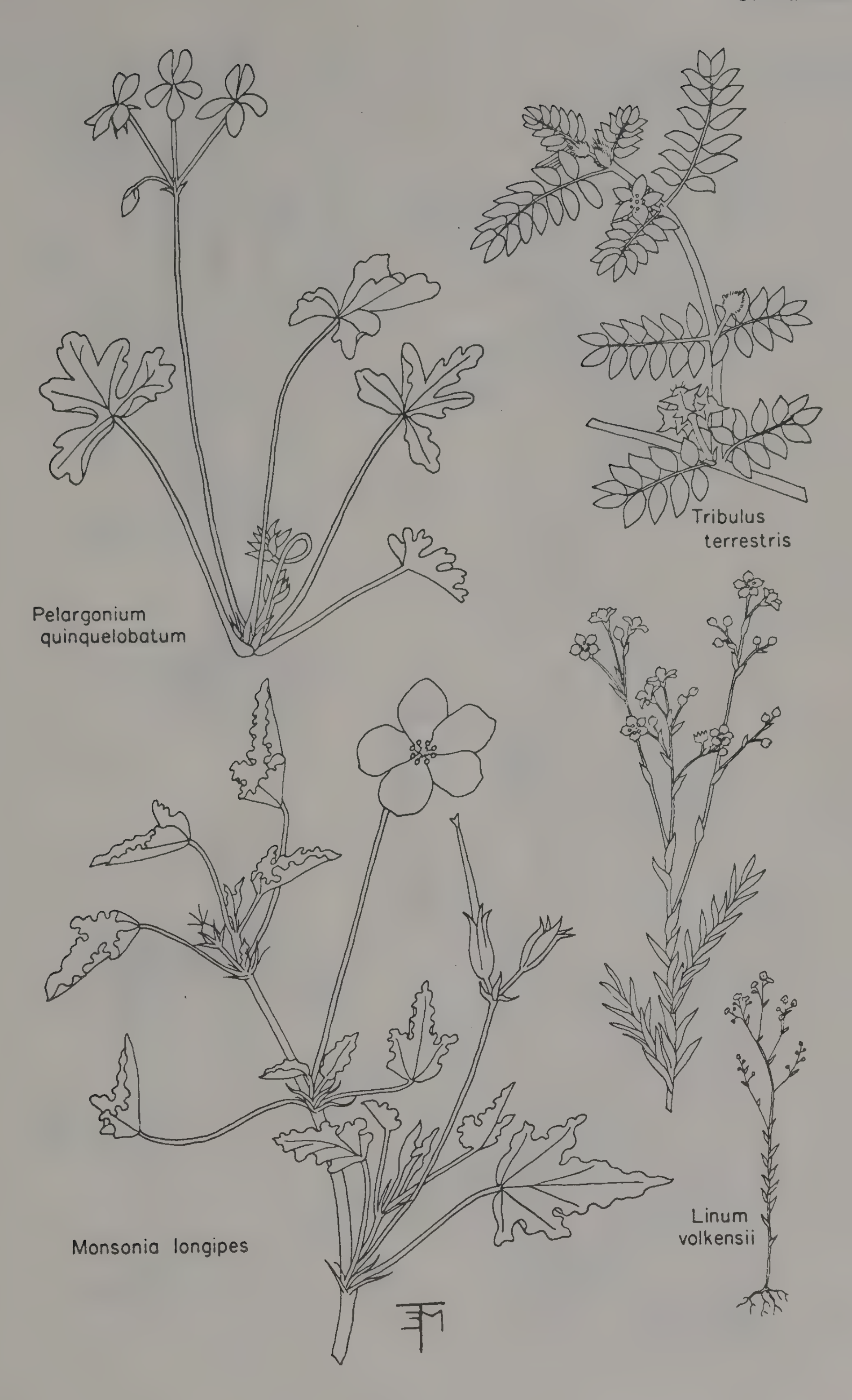
Hedberg 810.

5. **Oxalis latifolia** *H. B. & K.* (see p. 148)

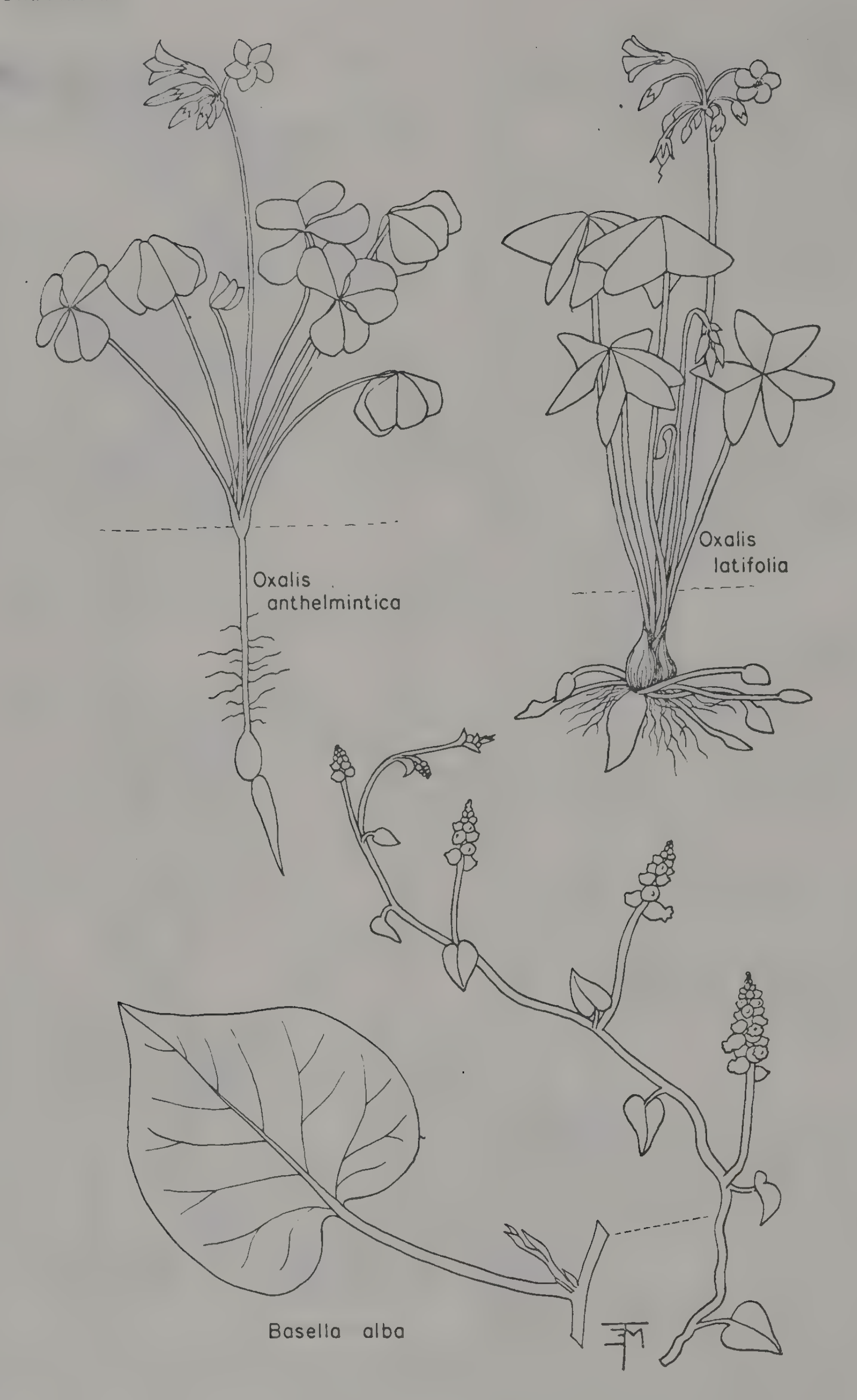
Acaulescent herb with leaves and peduncles arising directly from an oval bulb, from which also arise stolons with membranous scales, the end of each stolon developing a bulbil which eventually forms a new plant; flowers in 5- to over 20-flowered pseudo-umbels, light pink-purple with a green throat.

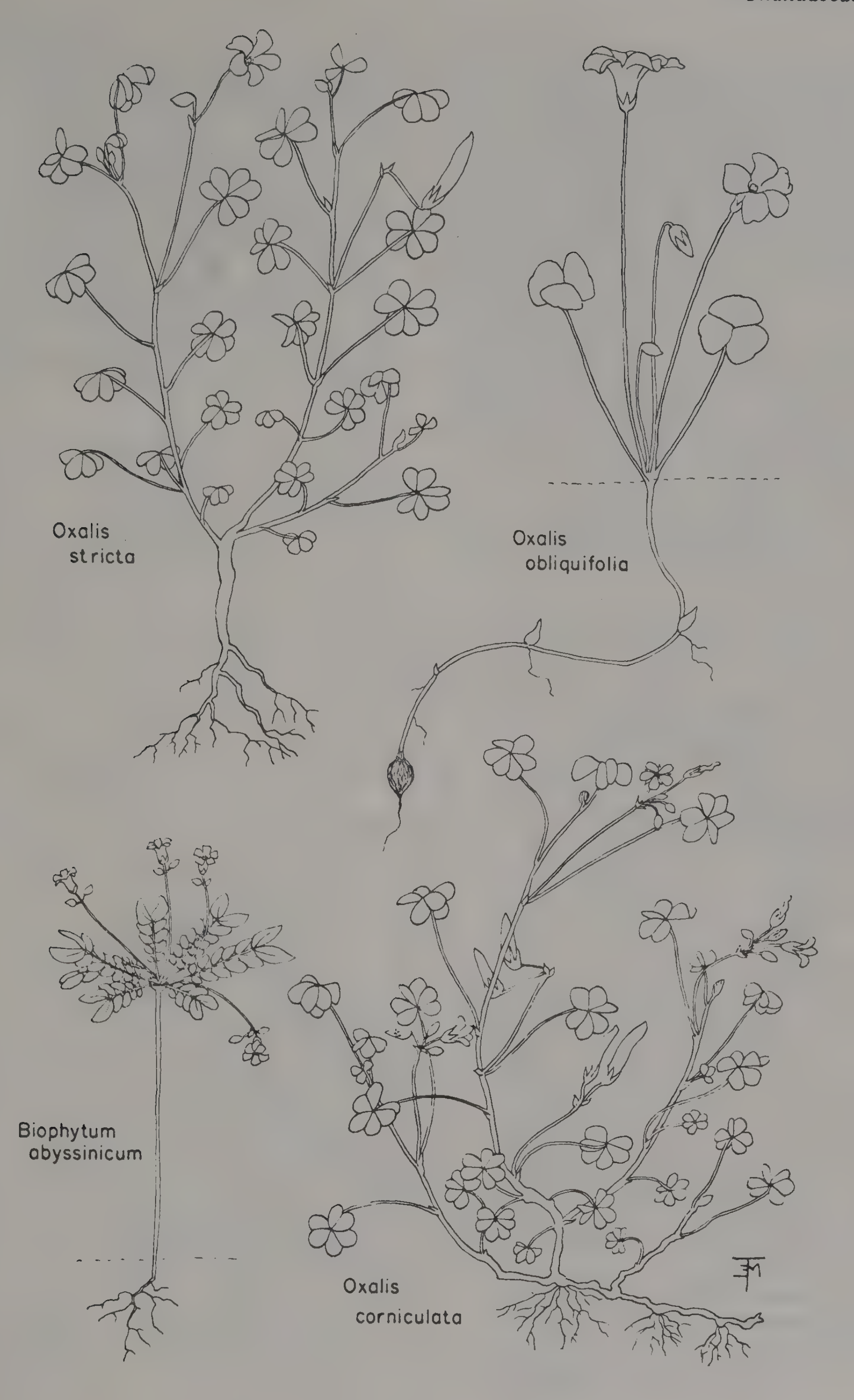
Locally common and obnoxious introduced weed, very difficult to eradicate because of its formation of many bulbils. On cultivated land, waste places, usually in moist and well-shaded parts, 3800-7500 ft. HE, HM, KIT, MAC, NBI.

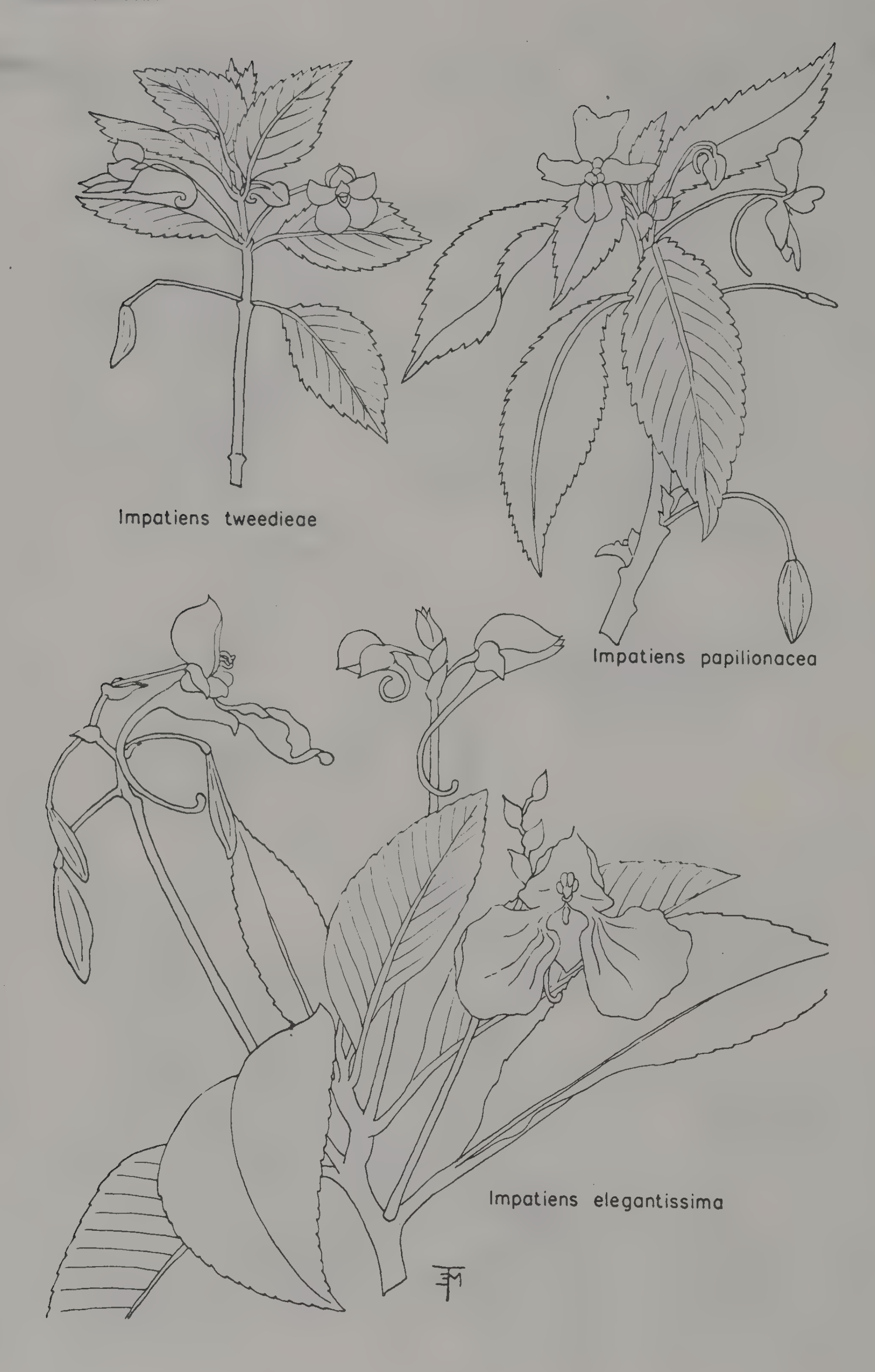
Williams 151; Mathenge 385.



Tribulus terrestris
Pelargonium quinquelobatum
Monsonia longipes
Linum volkensii


Oxalis
anthelmintica
Oxalis
latifolia
Basella alba


Oxalis
stricta
Oxalis
obliquifolia
Biophytum
abyssinicum
Oxalis
corniculata


Impatiens tweedieae
Impatiens papilionacea
Impatiens elegantissima

2. BIOPHYTUM *DC.*

Annual herbs with simple stems; leaves paripinnate, (the rachis ending in a bristle) fascicled or almost whorled at the top of the stem, sensitive to touch with leaflets closing downwards, leaflets inaequilateral, many, opposite or subopposite, obliquely rectangular or orbicular; flowers in pseudo-umbels; bracts small, persistent, forming an involucre at the base of pedicels; sepals strongly parallel-veined, those towards the centre of the pseudo-umbels narrower than the outer ones; petals free in bud but later adherent above the free base, pink (in ours); capsule globose.

1 Sepals up to 3 mm long — 1. *B. abyssinicum*
Sepals over 5 mm long — 2. *B. petersianum*

1. Biophytum abyssinicum *A. Rich.* (see p. 147)

A glabrescent annual with a rosette of sensitive, pinnate leaves held off the ground by the erect, unbranched stem; flowers pale pink or white in long-pedunculate pseudo-umbels.

Occasionally common in bare sandy ground in western Kenya, 5000–8000 ft. HE, HC, KIT, BAR, MAC.

Agnew, Kibe, and Mathenge 10247; Archer 231.

2. Biophytum petersianum *Klotzsch*

Similar to *B. abyssinicum* except for the stiffer leaflets with lateral nerves coming off the midrib strictly at right-angles.

Uncommon plant found in grassland in western Kenya. MUM, KIS.

Tweedie 67/251; Lind in EAH 10493.

34. BALSAMINACEAE†

Herbs or shrubs with opposite or alternate, exstipulate leaves; inflorescences racemose, usually axillary, or flowers solitary; flowers bisexual, zygomorphic, subtended by a bract but without bracteoles, twisted during development so that the posterior side appears anteriorly; sepals 3, rarely 5, petals 5, the anterior one keeled and held posteriorly, the others fused in lateral pairs, each lateral 2-lobed; stamens 5, alternating with the petals, the filaments connate above the ovary, forming a cap which usually must be removed (by a pollinator or by growth) before the stigmas can receive pollen; ovary superior, of 5 carpels, with axile placentation of many ovules; style short, simple; stigmas 1–5; fruit a capsule or berry; seed without endosperm and with a straight embryo.

† By A. D. Q. Agnew.

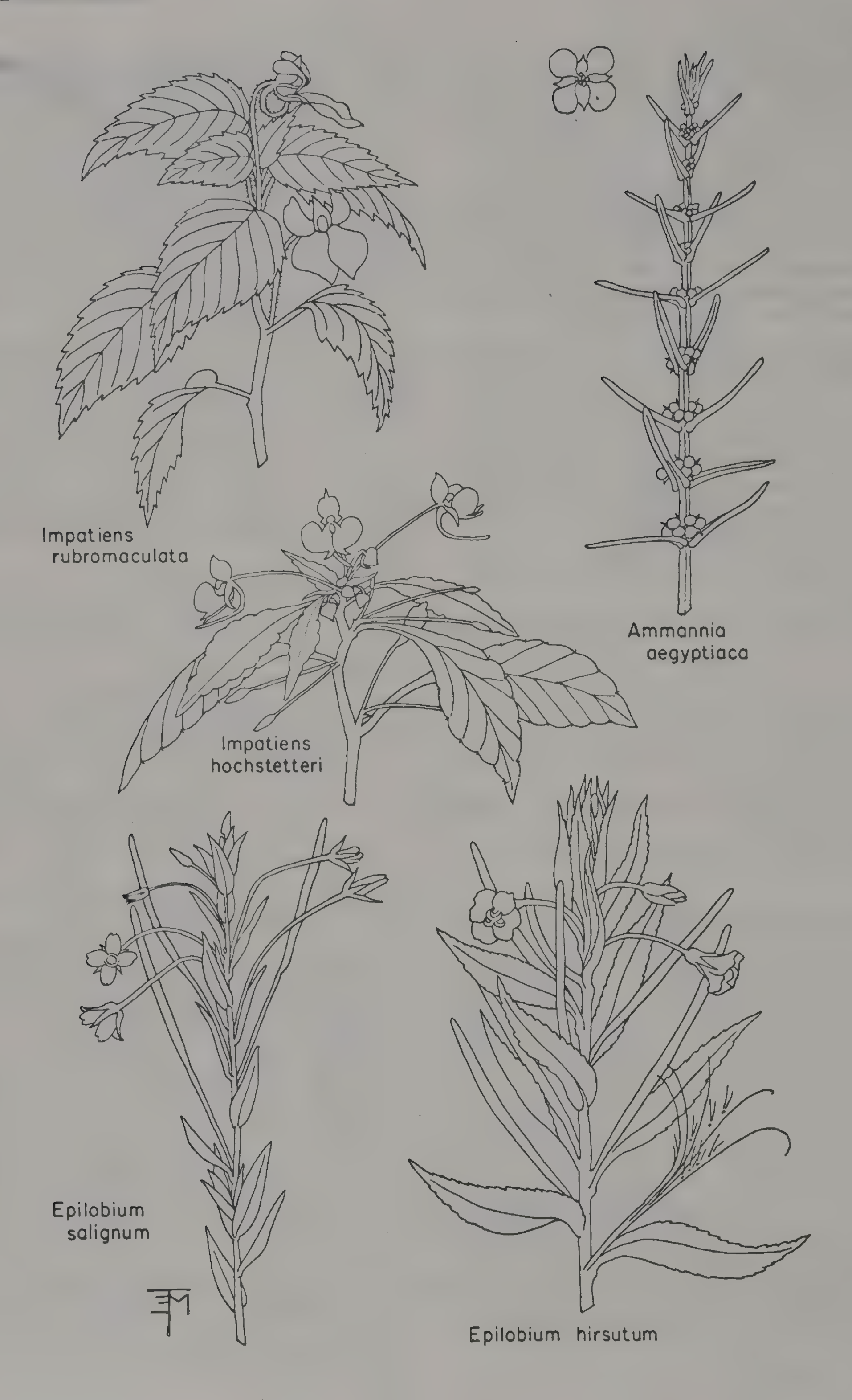
1. IMPATIENS *L.*

Herbs (often subsucculent) or shrubs commonly rooting at the nodes, with alternate, opposite or whorled leaves; leaves serrate at margin, with (in ours) tentacle-like hairs on the serration, sometimes extending into the petiole, all (in ours) lanceolate, elliptic or ovate, acute at apex; flowers solitary, in racemes, or in sessile or pedunculate umbels; posterior sepal spurred, other floral characters as in the family; fruit an explosively dehiscent loculicidal capsule, which throws the seeds out with great force, and which can be triggered by a light touch.

Floral features give a distinctive pattern to each species and are best seen in an illustration. Thus users of the key are urged to compare their flower with the illustration of the keyed species.

Note that in the key the words 'posterior' and 'anterior' are used to denote positions on the flower as it appears on the plant, the posterior being the upper side with the keeled petal, and the anterior being the lower side with the spurred sepal.

1 Inflorescences pedunculate, peduncle more than 1 cm long, or flowers solitary with a bract half way or more along the apparent pedicel — 2
Flowers fasciculate or solitary in the axils, with bracts at base of pedicel — 7
2 Leaves apparently whorled; spur 4 cm long or more; flowers with 5 equally large petaloid limbs — 1. *I. sodenii*
Leaves alternate, or, if occasionally whorled, then spur less than 4 cm long; flowers with less than 5 petaloid limbs, or limbs of different size — 3
3 Spur shortly bifid at tip; petals white with dark red spots and lines within — 2. *I. elegantissima*
Spur simple; petals white, red or pink, never white with many spots and lines within — 4
4 Petioles with capillary 'glands' — 5
Petioles without capillary 'glands' — 6
5 Spur narrow (to 3 mm wide at base), hairy, abruptly widening into the calyx limb; 2 lateral sepals — 3. *I. stuhlmannii*
Spur broad (over 3 mm wide at base), glabrous, gradually broadening into the calyx limb; 4 lateral sepals — 4. *I. fischeri*
6 Anterior lobes of petals shorter than lateral lobes and shorter than posterior calyx limb — 5. *I. nana*
Anterior lobes of petals longer than lateral lobes and longer than posterior calyx limb — 6. *I. telekii*
7 Spur about 3 mm wide at base, passing gradually into the calyx limb — 8


Impatiens
rubromaculata
Ammannia
aegyptiaca
Impatiens
hochstetteri
Epilobium
salignum
Epilobium hirsutum

Spur less than 2 mm wide at base, abruptly widening into the calyx limb 11
8 Spur coiled into a semicircle or full circle at tip or bent through more than 90° 9
Spur straight 7. *I. phlyctidoceras*
9 Spur acute, and entire at apex 10
Spur very bluntly 2-lobed at apex 8. *I. niamniamensis*
10 Leaves opposite 9. *I. tweediae*
Leaves alternate 12. *I. rubromaculata*
11 Spur shorter than its calyx limb 10. *I. eminii*
Spur longer than its calyx limb 12
12 Pedicel and sepals (with spur) glabrous; upper surface of leaves without a line of hairs on the major lateral veins, most hairs being between them 11. *I. hochstetteri*
Pedicel and sepals often hairy; upper surface of leaves with a line of hairs along the major lateral veins as well as between them 13
13 Posterior petal as large as, or larger than, any of the other petal lobes; spur mostly glabrous, gently curved 13. *I. papilionacea*
Posterior petal exceeded 2–4 times in length by other petal lobes; spur mostly hairy, usually abruptly bent so that the apex approaches the calyx limb 12. *I. rubromaculata*

1. Impatiens sodenii *Engl. & Warb.*

An erect glabrous woody herb, unbranched or branched from the base only, with 10–15 elliptic to oblanceolate leaves in each whorl; petals nearly equal, forming a flat, pink, red, or white sub-orbicular outline.

Locally common in escarpment zones and waterfalls where mist is frequent. HE, HA, RV, MAC.

Bogdan 496; Agnew and Hanid 8357.

2. Impatiens elegantissima *Gilg* (see p. 150)

An erect glabrous or glabrescent herb, 1–3 m tall, with alternate elliptic leaves; flowers almost trumpet-shaped, white with pink or red spots, with very large anterior lobes, and bifid spur.

A common *Impatiens* in waterfalls and stream banks in the wetter highland forest areas. HE, HC, HT, HM, HA, HK, KIT, MUM.

Agnew, Azavedo, and Khatri 9547; Polhill 235.

3. Impatiens stuhlmannii *Warb.*

Pubescent herb to 1 m, with ascending stems and ovate-elliptic leaves; flowers pink to red with large anterior lobes.

A rare *Impatiens* of wet lowland forests, recorded only from the Kakamega-Yala area. MUM. It is occasionally cultivated.

Drummond and Hemsley 4767; Wyatt 30.

4. Impatiens fischeri *Warb.*

An erect, glabrous, sparsely branched herb with alternate ovate leaves; flowers bright red to scarlet.

A common plant of wet highland forest but seldom profusely flowering, which is a pity since it is most attractive. HA, HK.

Verdcourt and Polhill 2986; Agnew and Lind 5618.

5. Impatiens nana *Eckl. & Warb.*

Glabrous or sparsely pubescent herb with ascending stems to 50 cm, rooting at the nodes, ovate-elliptic leaves and usually solitary flowers; flowers pink or white, sometimes with a yellow spot at the base of the lateral petals.

A common plant of wet places in highland forest at lower altitudes. HA, HK, HM, MAC.

Agnew 7674; Polhill and Verdcourt 265.

6. Impatiens telekii *T. C. E. Fries.*

A similar plant to *I. nana* but glabrous, with usually 2 pink flowers on each peduncle.

This has only been found in the wet forest of Mt. Kenya. HK.

Agnew and Coe 8756.

7. Impatiens phlyctidoceras *Bullock*

An erect pubescent herb with alternate ovate-elliptic leaves and solitary scarlet-crimson flowers; flowers with a small corolla and very long, thick spur which is lobed at apex.

Rare plant found on Mt. Elgon and only once collected. HE.

Lugard 313 (isotype).

8. Impatiens niamniamensis *Gilg*

A glabrous woody herb often (with support) reaching to over 2 m tall, with ovate-lanceolate leaves; flowers red, with small petals and big spur.

A rare plant only found in lowland wet forest, and in our area only in MUM and KIS.

Bally B 6478; Gillett 16728.

9. Impatiens tweediae *E. A. Bruce* (see p. 150)

A pubescent trailing herb to 40 cm tall, the ascending stems becoming somewhat woody at base, with opposite, elliptic to suborbicular leaves; flowers red.

A plant confined to forests on Mt. Elgon, where is is not uncommon. It is named after Mrs. E. M. Tweedie who drew the illustrations, and also made many collections for this flora. HE.

Tweedie 67/11; Adamson 503.

1. Ammannia aegyptiaca *Willd.* (see p. 152)

Erect annual with ascending to spreading branches and sessile lanceolate leaves.

A plant of river banks, marshes, and lake or pool margins; properly collected and carefully annotated material is needed. HE, KIT, MUM, NAN, MAC.

Dalton in CM 18058; Lugard 536.

2. Ammannia baccifera *L.*

Glabrous erect annual with simple or branched stem and linear-elliptic to narrowly oblanceolate leaves.

A small herb of marshy places. MAC, NBI.

Verdcourt 3634; Agnew 9419.

3. Ammannia auriculata *Willd.* (*A. prieureana* Guill. & Perr. of Check List.)

Glabrous, erect, with simple, or more often branched stems and linear-oblong or lanceolate leaves.

A herb, often small, of seasonally wet shallow soils overlying rocks, river banks, and margins of lakes and pools; sometimes a weed in irrigated land. HE, KIT, EMB, MAC, NBI.

Verdcourt 3250; Tweedie 67/231.

4. Ammannia sarcophylla *Hiern.*

Prostrate to erect, rooting at the nodes, with spongy stem bearing obovate, sessile glaucous leaves; cymes very shortly pedunculate or sessile.

A rare plant found in wet soils marginal to fresh-water lakes and pools; only one specimen recorded so far from Kisumu; this species is much in need of further collecting. KIS.

McMahon K 302.

2. LYTHRUM *L.*

Glabrous annual or perennial herbs with decussate, whorled or alternate leaves and solitary, axillary, subsessile and (in ours) tetramerous flowers; calyx tubular, with evident appendages between deltoid lobes; petals much longer than and alternating with calyx-lobes; stamens (in ours) 8, exserted; ovary sessile, 2-celled; style (in ours) longer than the calyx tube; capsule included in the calyx, 2-valved, septicidal; seeds many, small.

Lythrum rotundifolium *A. Rich.*

Trailing succulent herb with stem often tinged red and short ascending branches; leaves opposite, very shortly petiolate or sessile, ovate to rotund, base broadly cuneate to rounded or cordate-auriculate and amplexicaul; flowers solitary, axillary, purplish.

A fairly common, pretty little herb of wet places along streams, in swamps, and lake margins. HT, HM, HL, HA, KIT, MUM, RV, NAN, EMB.

Verdcourt 2493; Hanid and Kiniaruh 427.

3. NESAEA *Commers.*

Herbs, undershrubs, or shrubs with entire, sessile or shortly petioled, decussate, or whorled, or sometimes alternate leaves; flowers axillary, solitary or in stalked cymes or capitulum-like heads; bracteoles borne on peduncles; calyx campanulate or urceolate, persistent, with 4–8 lobes and as many appendages; petals as many as calyx-lobes, usually exserted, deciduous; stamens in 1–2 rows; ovary sessile, 2–5-celled; capsule enclosed in the calyx, membranous, dehiscing by valves or by irregular slits at the apex.

1 Flowers in bracteate heads; peduncles usually more than 3 mm long, with bracts at the top; bracts more than 1 mm long, enclosing the very short pedicels — 2
  Flowers in 1–3-flowered cymes; peduncles usually up to 3 mm long, with bracts below the pedicels; bracts up to 1 mm long, not enclosing the distinct pedicels — 3
2 Plant tomentose; calyx-lobes 6 — 1. *N. floribunda*
  Plant glabrous; calyx-lobes 4 — 2. *N. erecta*
3 Leaf-apex usually acute; calyx-tube subglobose-cylindrical, 6-lobed — 3. *N. lythroides*
  Leaf-apex usually rounded; calyx-tube turbinate, 4-lobed — 4. *N. schinzii*

1. Nesaea floribunda *Sond.*

A tomentose annual herb with oblanceolate to ovate leaves and purplish pink flowers.

A plant of wet shallow soils, often growing amongst rocks in seeping water and near rivers in sandy places. HA, KIT, EMB, MAC.

Bally 11572; Archer 371.

2. Nesaea erecta *G. & P.*

A glabrous annual with narrowly elliptic to oblanceolate leaves and 3 to many lilac or magenta flowers, in heads.

A small plant of wet shallow soils, often near ephemeral pools. HA, KIT, MAC, NBI.

Faden 67/628; Verdcourt 3242.

3. Nesaea lythroides *Welw.*

A glabrous or hispid woody perennial herb or undershrub with sessile, narrowly lanceolate leaves and 1–3-flowered cymes; petals 6, pinkish to red.

10. Impatiens eminii *Warb.*

An erect, pubescent herb to 75 cm, with ovate-elliptic leaves; flowers usually cream, rather small.

A common herb by streamsides in wet lower altitude forests at Kakamega and Yala. MUM.

Strid 3355; Lucas 89.

11. Impatiens hochstetteri *Warb.* (*I. gilgii* T. C. E. Fries) (see p. 152)

Pubescent herb with ascending stems to 40 cm, rooting at the nodes, and with ovate-elliptic leaves; flowers with spreading white petals.

A common *Impatiens* of streamsides in wet forests. HE, HC, HM, HK, KIT, MUM, KIS, MAC.

Strid 3382; Kerfoot 4105.

12. Impatiens rubromaculata *Warb.* (*I. hoehnelii* T. C. E. Fries) (see p. 152)

A pubescent herb with ascending stems to 50 cm, rooting at the nodes, with alternate or rarely opposite or even whorled elliptic to subrhombic leaves; flowers bright pink, dominated by the spreading lateral petals.

A common and variable plant, defined here on the basis of the petal shape and not on variable features of the spur. The size of the flower varies considerably. It is common in upper levels of highland forest, in forest edges, and is found up to the tree-line in many places. HC, HM, HA, HK, HN, MAC.

Tweedie 66/390; Drummond and Hemsley 1226.

13. Impatiens papilionacea *Warb.* (*I. cruciata* T. C. E. Fries) (see p. 150)

A pubescent annual or perennial herb, with ascending stems to 40 cm, rooting at the nodes, and with ovate-elliptic alternate leaves; flowers pink, often with dark red spots in the centre.

A common *Impatiens* of the forest floor in highland forest, and also found in marshes. HE, HC, HM, HA, HK, KAJ.

Agnew 8734; Glover 993.

35. LYTHRACEAE†

Herbs, subshrubs, shrubs, or trees with opposite, rarely whorled or alternate leaves, mostly stipulate; inflorescence a cyme, very rarely a panicle or flowers solitary; flowers mostly regular, bisexual, 4–8-merous; sepals connate into a tube, valvate; petals free, inserted towards the top of the calyx-tube, and alternating with calyx-lobes, crumpled in bud, sometimes absent; stamens mostly 4 or 8, inserted on the calyx-tube below the petals; ovary superior, completely or incompletely 2–6-celled, rarely 1-celled, with numerous axile ovules in each loculus; fruit a capsule with circumscissile, valvular, or irregular dehiscence; seeds small, without endosperm; embryo straight.

1 Flowers in a terminal leafless raceme — 4. *Rotala repens*
  Flowers all axillary, solitary or in inflorescences — 2
2 Flowers solitary in each axil — 3
  Flowers (at least the majority of them) in sessile or pedunculate axillary cymes or heads — 5
3 Petals over 4 mm long — 4
  Petals less than 2 mm long or absent — 4. *Rotala*
4 Plant herbaceous, soft, trailing and rooting at the nodes — 2. *Lythrum rotundifolium*
  Plant shrubby or with a woody rootstock, not rooting at the nodes — 3. *Nesaea*
5 Calyx over 2 mm long or flowers in capitate heads surrounded by two enlarged bracts — 3. *Nesaea*
  Calyx less than 2 mm long; flowers in cymose clusters with obscure bracts — 1. *Ammannia and Rotala*

1. AMMANNIA *L.*

Herbs of damp places with decussate, sessile or subsessile leaves and 4-angled stems and branches; inflorescences of short, dense axillary cymes, with 2 bracteoles at the base of each pedicel; flowers 4–6-merous; calyx usually bell-shaped, 8-nerved, with or without appendages; petals 4 or absent, caducous, white or purplish-pink; stamens 4 or 8; ovary sessile, 1–4-celled, style filiform, persistent, longer than the calyx-tube or absent; stigma capitate; capsule globose, included in the calyx-tube or exserted, dehiscing transversely or irregularly; seeds numerous, globular or triangular in outline, often concave on one side.

1 Leaf-bases auriculate-cordate — 2
  Leaf-bases cuneate — 3
2 Cymes distinctly pedunculate; flowers pedicellate, style slightly shorter or up to twice as long as the capsule — 3. *A. auriculata*
  Cymes without peduncles, flowers subsessile, style much shorter than the capsule — 1. *A. aegyptiaca*
3 Stem spongy; appendage between calyx lobes elongate — 4. *A. sarcophylla*
  Stem not spongy; appendage between calyx lobes hardly evident — 4
4 Capsule opening by apical valves — *Rotala serpiculoides*
  Capsule opening irregularly and transversely — 2. *A. baccifera*

† By M. A. Hanid.

ovules in each cell; capsule elongate, splitting loculicidally into 4 valves from above; seeds brown, ellipsoid, with an apical tuft of silky hairs.

1 Stem densely villous-hairy 1. *E. hirsutum*
 Stem subglabrous to puberulous, rarely pubescent 2
2 Leaves cuneate to narrowly rounded at base; young flowers white or cream, turning pink after opening 2. *E. salignum*
 Leaves broadly rounded to subcordate at base; flowers pink or mauve even before opening 3. *E. stereophyllum*

1. Epilobium hirsutum *L.* (see p. 152)

Erect rhizomatous herb 1·2 m high, with ascending pale brown branches and densely villous or tomentose indumentum and with sessile, lanceolate to elliptic leaves.

A common plant of swampy and marshy places by rivers, streams, lakes, and pools. HE, HT, HA, KIT, RV, EMB, MAC.

Hanid and Kiniaruh 1031; Bogdan 337.

2. Epilobium salignum *Hausskn.* (see p. 152)

Erect, slender, herbaceous or woody herb to 1·5 m high, with reddish simple stem or often with a few ascending branches above, appressed grey-puberulous and with usually lanceolate leaves.

A common plant of swampy and marshy places near streams. HE, HC, HT, HA, KIT.

Tweedie 66/186; Bogdan 4218.

3. Epilobium stereophyllum *Fres.*

Stoloniferous herb usually less than 1 m high usually pubescent and with sessile, lanceolate leaves.

A farily common plant of swampy places in upland moors, grasslands, and on moist ground along streams and rivers. It is variable and has two varieties, one with indumentum less than 0·25 mm long and the other with indumentum 0·25–0·5 mm long. HE, HC, HT, HA, HK.

Lind, Agnew, and Harris 5121; Hedberg 1080.

2. LUDWIGIA *L.*

Decumbent, creeping or erect, slender herbs sometimes shrubby, often growing in water, the underwater parts often bearing aerenchymatous roots; leaves mostly alternate, simple, entire (in ours); stipules reduced or absent; flowers solitary, clustered, or sometimes in a terminal head, usually sessile, regular; hypanthium not prolonged beyond ovary; sepals 3–7, mostly 4–5, persistent; petals as many as sepal number, caducous, yellow in ours, aestivation contorted; stamens as many or twice as many as sepals, epipetalous; stigma hemispherical or capitate, often lobed, lobes as many as loculi; loculi of ovary as many as sepal number, with uniseriate or pluriseriate ovules in each cell; fruit a capsule, mostly elongate, with variable dehiscence; seeds rounded or elongate, free or surrounded by endocarp, without hairs, usually with a large easily visible raphe.

1 Stamens twice the sepal number 2
 Stamens as many as sepals 5
2 Seeds embedded in endocarp, uniseriate 3
 Seeds free, not embedded in endocarp, pluriseriate 4
3 Plants with spongy roots at nodes of floating branches; seeds firmly embedded in woody coherent endocarp, pendulous, appearing as rows of vertically elongated bumps between ribs on capsule wall 1. *L. stolonifera*
 Plants without spongy roots at nodes; seeds loosely embedded in horseshoe-shaped pieces of endocarp, horizontal, appearing as rows of horizontally elongated bumps between ribs on capsule wall 2. *L. leptocarpa*
4 Sepals 3–6 mm long 3. *L. octovalvis*
 Sepals 10–14 mm long 4. *L. stenorraphe*
5 Capsule glabrous, terete, ribs obscure 6. *L. abyssinica*
 Capsule puberulous or shortly pubescent, angled, ribs distinct 6
6 Sepals 1·3–3·5 mm long; capsule 1·3–1·9 cm long 5. *L. perennis*
 Sepals 6–13 mm long; capsule 2–4·3 cm long 7. *L. jussiaeoides*

1. Ludwigia stolonifera (*Guill. & Perr.*) *Raven* (*Jussiaea repens* L. *p.p.*)

Glabrous to densely villous perennial herb with prostrate or ascending stems rooting at the nodes, and floating stems producing clusters of whitish to pinkish swollen, spongy, fusiform, floating roots from the nodes, the leaves shining green, cuneate.

A common aquatic and floating plant of swamps, pools, lakes, and rivers. This is the only species of this genus (in our area) which produces the very remarkable spongy roots or pneumatophores, apart from the adventitious roots, from nodes of floating stems. HA, KIT, MUM, KIS, NAR, RV, MAC, NBI.

Hanid and Kiniaruh 715; Symes 352.

2. Ludwigia leptocarpa (*Nutt.*) *Hara*

Robust herb 0·4–2 m tall, with reclining or erect woody base, well-branched stem, and with lanceolate leaves.

A locally common plant of shallow soils overlying rocks and dry grassland, especially in the Nairobi area. A glabrous form with campanulate calyx-tube has been found at the bottom of the escarpment on the Nairobi–Naivasha road. HA, NAR, RV, MAG, MAC, NBI.

Agnew 7795 and 9190; Greenway 9168.

4. Nesaea schinzii *Koehne*

A glabrous, profusely branched, erect perennial herb with sessile lanceolate leaves and 1–3-flowered cymes; petals 4, pink.

A rare plant of western grasslands recorded only from Muhoroni in Lumbwa District. MUM.

Opiko 657.

4. ROTALA *L.*

Glabrous herbs, aquatic or growing in wet places, with decussate or whorled or rarely alternate simple leaves; flowers small, axillary and solitary or few together, sessile or subsessile, usually bibracteate; flowers 3–6-merous, sometimes dimorphic; calyx campanulate or urceolate-tubular, hemispherical in fruit, usually 4-lobed, rarely 5-lobed, appendages mostly absent or setiform; petals minute, persistent, as many as calyx-lobes or absent; stamens 1–5, usually 4, free; ovary incompletely 1–4-celled; capsule 2–4-valved, septicidal.

1 Plant submerged aquatic; leaves linear; flowers in terminal racemes 1. *R. repens*
  Plant with aerial stems; leaves broader than linear; flowers all axillary 2
2 Plant erect; leaves narrow-elliptic 2. *R. serpiculoides*
  Plant trailing; leaves oblong to obovate, often clasping the stem at the base 3
3 Calyx-lobes lanceolate; mature capsule half as long as calyx 4. *R. urundiensis*
  Calyx-lobes triangular-obtuse; mature capsule equalling calyx in length 3. *R. tenella*

1. Rotala repens (*Hochst.*) *Koehne*

Glabrous aquatic herb with anchored rhizome, submerged stems and filiform leaves; aerial racemes of white to pinkish flowers.

A rare plant found in streams, often growing on stones in stagnant water. It is recorded only from Suam River and is in need of further collection. KIT.

Taylor 3412.

2. Rotala serpiculoides *Hiern*

Glabrous erect annual herb, 3–20 cm high, with simple or slightly branched stem; superficially very similar to *Ammannia baccifera* L. but differing in having deltoid-acuminate calyx lobes and valvular dehiscence in the 4-valved capsule.

A small infrequent herb found in damp areas so far recorded from Kaptagat in rockpools, Nairobi National Park in vlei in forest area, and from Thika area in a temporary pool. HT, MAC, NBI.

Verdcourt 536; Faden 67/629.

3. Rotala tenella *Hiern*

Glabrous trailing perennial herb with ascending stems bearing obovate to oblong, sessile leaves which may reach 1·5 cm in length; capsule 2 mm long.

A rare herb found in wet places and seasonally flooded pools. EMB, MAC, NBI.

Faden 67632.

4. Rotala urundiensis *Fernandez & Diniz*

Similar to *Rotala tenella* but with the keyed differences, and smaller in all parts; capsule less than 2mm long.

A small herb of wet places, often growing in colonies to form cushions, so far recorded from Kitale area only. KIT.

Tweedie 67/23.

36. ONAGRACEAE†

Herbs, rarely shrubs or trees, with alternate or opposite or rarely whorled, stipulate or exstipulate, simple leaves; flowers solitary and axillary or sometimes aggregated into panicles or racemes, usually bisexual, regular or rarely irregular; sepals valvate, 2–7, mostly 4 or sometimes 5; petals free, as many as sepal number, contort or imbricate, fugacious, rarely absent; stamens the same as or twice the sepal number, very rarely fewer, in 1–2 rows; ovary inferior, mostly 4-celled, rarely 1–7-celled, with one to many axile ovules per cell; style simple; fruit a capsule, rarely a nut or berry; seeds without endosperm.

1 Seeds with a tuft of silky hairs at the top 1. *Epilobium*
  Seeds without any hairs 2
2 Sepals persistent above the fruit; fruit septicidal 2. *Ludwigia*
  Sepals not persistent above the fruit; fruit loculicidal 3. *Oenothera rosea*

1. EPILOBIUM *L.*

Annual or perennial herbs, sometimes thinly woody, with (in ours) denticulate or serrulate to subentire opposite leaves; stipules absent; flowers mostly regular, white to pink, red or purple; sepals and petals 4; hypanthium or receptacle not or hardly prolonged above the ovary; stamens 8; stigma entire or ± 4-cleft; ovary with uniseriate

† By M. A. Hanid.

1. TRAPA *L.*

The only genus in the family, with the characters of the family.

Trapa natans *L.*

Shortly pubescent annual aquatic herb with leaves forming a rosette on water surface, floating by means of the inflated petioles; fruit with 4 horns varying in size, shape and direction.

An aquatic plant of still waters at lake edges. It is recorded only from Kisumu and Kendu Bay in our area. More flowering and fruiting material required. KIS.

McMahon K318.

38. HALORAGACEAE†

Herbs, often aquatic, with opposite, spiral or whorled leaves of variable shape, exstipulate or with intrapetiolar scales; inflorescences usually racemose; flowers small, inconspicuous, regular, never more than 4 each, sometimes one or both whorls absent; stamens 8, 4, or 2; ovary inferior, with 1 or 4 cells, with one ovule in each; styles 1–4, often short, each ending in a feathery or papillose stigma; fruit a nut or drupe; seeds with endosperm.

1 Leaves linear, sessile, almost entire — 2. *Laurembergia engleri*
Leaves not linear or entire — 2
2 Leaves petiolate, simple, orbicular, serrate — 1. *Gunnera perpensa*
Leaves sessile, pinnate, oblong — 3. *Myriophyllum brasiliense*

1. GUNNERA *L.*

Rhizomatous herbs, with (often very large) long-petiolate orbicular or ± peltate leaves with intrapetiolar scales; inflorescence a racemose panicle with male and female flowers on the same or separate panicles, and sometimes also with bisexual flowers; sepals 2–3 or absent; petals 2 or absent; stamens 1–2; ovary 1-celled, with 1 ovule, and with 2 styles and stigmas; fruit a 1-celled drupe.

Gunnera perpensa *L.*

A creeping perennial herb with a thick rhizome and orbicular shallowly lobed leaves; inflorescence a narrow panicle of sessile reddish spikes overtopping the leaves, female below and male above.

A rare plant of riverside marshes and low vegetation in the wettest highland forest, 7000–8500 ft. HA, HK.

Gardner 1882; Agnew and Lind 5868.

† By A. D. Q. Agnew.

2. LAUREMBERGIA *Berg.*

Small creeping herbs with simple, opposite or alternate leaves; flowers fasciculate in leaf axils, unisexual, both male and female together; male flowers with 4 sepals, 4 petals, and 4 nearly sessile anthers; female flowers with 4 sepals, petals absent and an inferior ovary with 4 nearly sessile stigmas; fruit globose, hard, indehiscent, 1-seeded, strongly warted on the outside.

Laurembergia engleri *Schindl.*

Prostrate creeping pubescent herb with ascending stems and linear or very narrowly oblanceolate leaves.

A rare plant only recorded from Kitale district, in grassy swamps. KIT.

Napper 790; Tweedie 67/21.

3. MYRIOPHYLLUM *L.*

Perennial aquatic herbs with whorled pinnate leaves, the segments capillary; flowers in bracteate terminal spikes, unisexual or bisexual; male flowers with 4 sepals, 4 petals and 4–8 stamens; female flowers with 4 obscure sepals, no petals and the ovary 4-celled, with 1 ovule in each cell, and 4-stigmas; fruit separating into 1-seeded nutlets.

Myriophyllum brasiliense *Cambess.*

Leaves glabrous, usually 5 in each whorl with 5–10 pairs of pinnae.

Apparently a rare escape from aquaria and recorded once from Nairobi. NBI.

Bond in EAH 13810.

39. CALLITRICHACEAE‡

Annual or perennial, creeping or aquatic herbs with small opposite entire exstipulate leaves; flowers axillary, unisexual (monoecious), solitary or in pairs, with bracteoles 2 or absent; sepals and petals 0; stamens 1, with only 1 pollen sac; ovary with 4 lobes, 2 styles, 4 loculi with one ovule in each; fruit separating into 4 winged or keeled druplets; seeds with endosperm.

1. CALLITRICHE *L.*

The only genus, with the characteristics of the family.

Callitriche stagnalis *Scop.*

A glabrous prostrate herb creeping and rooting at the nodes, with obovate to spathulate leaves and inconspicuous flowers.

A common plant in pools and wet paths in and above the bamboo zone to 14 000 ft, and rarely

‡ By A. D. Q. Agnew.

This plant is found along the shores or Lake Victoria, and in our area only in MUM and KIS.
Hanid and Kiniaruh 722; McMahon K297.

3. Ludwigia octovalvis (*Jacq.*) *Raven* (*L. pubescens* (L.) Hara, *Jussiaea suffruticosa* L.)

Well-branched robust herb or shrub up to 3·6 m tall, densely spreading-hairy, especially on younger parts, with usually narrow lanceolate leaves.

A highly polymorphic and variable species found in swampy places and damp areas by streams, rivers and lakes. It is recorded in our area only from south Nyanza and from Athi River, 20 miles beyond Thika, and is badly in need of further collection. KIS, MAC.
Hanid and Kiniaruh 779; Bally in CM 9202.

4. Ludwigia stenorraphe (*Brenan*) *Hara*

Erect much-branched robust suffructicose herb or shrub 1–3m high, with indumentum of dense or sparse, erect or appressed hairs and with often narrow elliptic leaves.

A very polymorphic species of *Ludwigia* found in swampy situations by watercourses, lakes, in flooded grasslands and on wet sandy river-beds. The sepals often turn reddish inside after anthesis, and are 6–9 mm long in ssp. *stenorraphe* and 10–14 mm long in ssp. *macrosepala*, but more material is required. HA, MUM, EMB.
Sunman 2219; Battiscombe 1122.

5. Ludwigia perennis *L.* (*Jussiaea perennis* (L.) Brenan)

Erect, slender, usually unbranched annual herb up to 50 cm high, subglabrous to minutely puberulous on younger parts, with very short tap-root and with elliptic to linear leaves.

A rare plant of swampy and wet places, such as the flood-plains of lakes and rivers. It is recorded in our area only from 18 miles SSW of Embu (Bogdan 4447); this record is from Raven (1963)†. EMB.

6. Ludwigia abyssinica *A. Rich.* (*L. erecta* of Check List)

Erect or straggling herb, often woody at base, up to 3 m tall, much branched, glabrous except for minute hairs on midribs and margin of younger lanceolate leaves.

A common plant of swampy situations along watercourses, and near pools and lakes. HE, HC, HA, KIT, MUM, KIS, NAR, MAC, NBI.
Agnew, Hanid, Musumba, and Kiniaruh 8462; Glover, Gwynne, Samuel, and Tucker 2405.

† Reinwardtia **6**: 368.

7. Ludwigia jussiaeoides *Desr.*

Tall herb (up to 3 m), sometimes slightly woody, minutely puberulous or shortly pubescent, especially on young parts with lanceolate leaves.

A rare species of *Ludwigia* found in seasonally flooded places and disturbed ground. It is predominantly a coastal species, recorded only from Cherangani Hills (Tweedie B7617) in our area; this record is from Raven (1963)‡. HC.

3. OENOTHERA *L.*

Annual to perennial herbs with spirally arranged leaves and (in ours) solitary flowers in axils of upper leaves; hypanthium prolonged beyond the ovary, caducous after anthesis; flowers tetramerous; sepals strongly reflexed, caducous; petals contort, pink, white, or yellow; stamens 8; stigma entire or 4-lobed; fruit a capsule dehiscing loculicidally into 4 valves; seeds ellipsoid or elongated, free, usually with clearly visible raphe.

There are at least three introduced species of this American genus in our area, of which *O. rosea* is naturalised in NBI.

Two yellow-flowered species occur infrequently as casuals, escaping from gardens to waysides and waste places.

Oenothera rosea *Ait.*

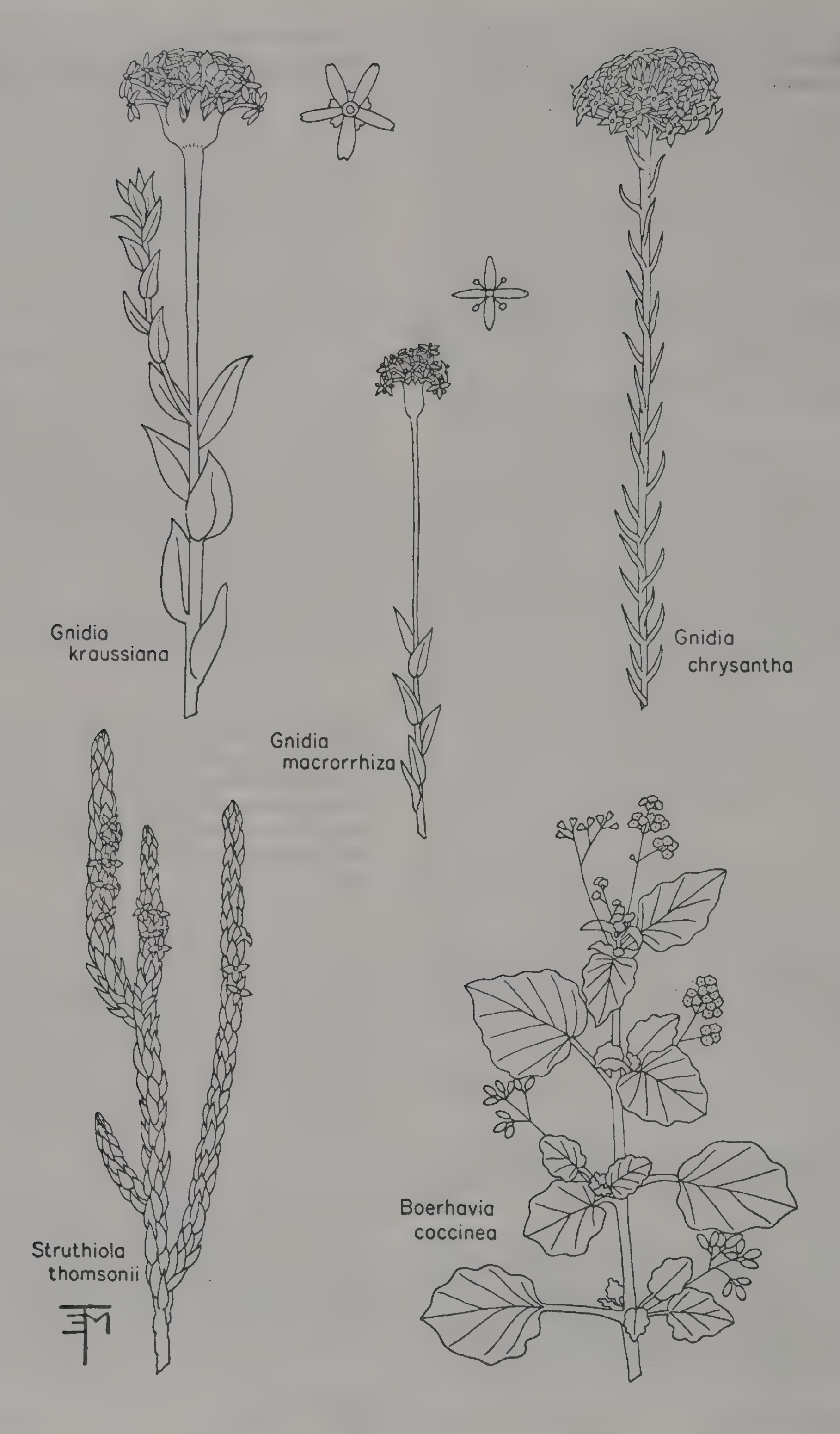
A biennial to perennial erect herb up to about 60 cm high, tomentose, slightly woody and often reddish at the base, with elliptic to obovate leaves.

An American Evening Primrose naturalized locally and apparently spreading. So far it has only been recorded along the banks of Nairobi River. NBI.
Hanid 17; Verdcourt 3042.

37. TRAPACEAE§

Floating herbs with long-petioled alternate leaves; stipules small, long-linear, acuminate, scarious; petiole swollen above the middle; lamina deltoid-ovate with serrate margins; submerged stem with paired greenish root-like structures of unknown morphology, each structure pinnatisect into many filiform segments and arising one from either side of the leaf-scar; flowers solitary, axillary, pedicellate, bisexual, regular, tetramerous; sepals persistent, accrescent; petals longer than sepals, white; ovary semi-inferior, 2-celled, with one pendulous ovule per loculus; fruit a bony or coriaceous drupe, 1-seeded, 1-locular, with 2–4 horns derived from persistent sepals; seeds without endosperm, one large and thick, the other small and scale-like.

‡ *loc. cit.* p. 355.
§ By M. A. Hanid.


Gnidia
kraussiana
Gnidia
chrysantha
Gnidia
macrorrhiza
Struthiola
thomsonii
Boerhavia
coccinea

lower to the level of Nairobi. HE, HT, HA, HK, NBI.

Verdcourt 2000.

40. THYMELAEACEAE†

Trees, shrubs, or herbs with simple opposite or alternate leaves and strong phloem fibres which show as a silky fringe when the stem is broken; flowers mostly sessile in spikes or heads, bisexual, regular; calyx with a long cylindrical tube, the lower part persistent round the ovary in fruit, 4–5-lobed; corolla present as corona-like projections at the mouth of the calyx, or absent; stamens equal to or twice the number of the calyx lobes, included in the calyx tube, often at different levels; ovary superior 1–2-celled, with a single pendulous ovule in each cell; style often lateral; stigma capitate; fruit an achene or drupe.

The trees and shrubs of the genera *Dicranolepis, Englerodaphne* (= *Gnidia*), *Peddiea, Struthiola*, and *Synaptolepis* as well as some woody species of *Lasiosiphon* (= *Gnidia*) are dealt with in KTS. Only two genera have herbaceous members.

1 Leaves imbricate, glabrous with a fringed margin; flowers solitary — 1. *Struthiola thomsonii*
  Leaves not imbricate, glabrous or hairy but never hairy only on the margin; flowers in heads, rarely solitary — 2. *Gnidia*

1. STRUTHIOLA *L.*

Low woody shrubs with solitary, axillary flowers; calyx with 4 lobes; petals 4–8; stamens 4; fruit dry.

Struthiola thomsonii *Oliv.* (see p. 160)
Dealt with in KTS p. 557.

2. GNIDIA *L.* (incl. *Lasiosiphon* Fres., *Arthrosolen* C. A. Mey., *Englerodaphne* Gilg)

Perennial herbs, shrubs, or trees with strong fibrous bark; leaves opposite or alternate, linear-lanceolate-oblong, without stipules; flowers 4–5-merous, shortly pedicelled, in ebracteate, few-flowered (2–8) fascicles (*G. subcordata*), or in bracteate few–many-flowered (2–50), terminal or axillary heads; calyx-tube cylindric, articulated above the ovary, with imbricate, coloured lobes; petals present or absent, membranous, fleshy, scaly or glandular; stamens 8 or 10 in two whorls; ovary sessile, 1-celled; style filiform, stigma capitate; hypogynous disc, usually minute, often absent; fruit dry, enclosed in the persistent base of the calyx-tube.

1 Flowers with parts in 5s — 2
  Flowers with parts in 4s — 5
2 Petals 0 — 1. *G. latifolia*
  Petals 5 — 3
3 Suffrutescent herb up to 50 cm — 2. *G. kraussiana*
  Much branched shrub or tree — 4
4 Tree to 15 m; leaves glaucous, glabrous or glabrescent — 3. *G. glauca*
  Undershrub to 4 m; leaves densely pubescent — 4. *G. lamprantha*
5 Petals 0 — 5. *G. chrysantha*
  Petals present — 6
6 Heads of flowers without bracts at the base — 6. *G. subcordata*
  Heads of flowers with bracts at the base — 7
7 Calyx-tube hairy below the articulation, petals (often very small) 8 — 7. *G. fastigiata*
  Calyx-tube ± glabrous below the articulation, petals 4 — 8
8 Bracts broadly oblong–subrotund, brownish — 8. *G. buchananii*
  Bracts ovate, acute — 9
9 Inflorescences terminal; unbranched perennial herb — 9. *G. macrorrhiza*
  Inflorescences terminal and axillary; much branched, suffrutescent plant to 1 m — 10. *G. apiculata*

1. Gnidia latifolia (*Oliv.*) *Gilg*
Shrub to 6 m. Dealt with in KTS p. 556. MAC.

2. Gnidia kraussiana *Meisn.* (see p. 160)
Perennial herb up to 50 cm with herbaceous or ligneous stems from a woody base, glabrous or pubescent; leaves lanceolate-ovate, 15–40 mm long, 4–12 mm wide, quite glabrous to densely pubescent; flowers in terminal heads, bracts foliaceous, lanceolate or ovate, calyx-tube pubescent outside and with long white silky hairs at the base.

A very variable plant ('Yellow-heads') found in grassland and on rocky banks. HC, HM, MUM.

Dale 3386; Archer 241.

3. Gnidia glauca (*Fres.*) *Gilg*
Shrub or tree to 15 m. Dealt with in KTS p. 556. HE, HC, HM, HA, HK.

4. Gnidia lamprantha *Gilg*
Shrub or tree to 5 m. Dealt with in KTS p. 556. HC, KIT, KIS.

5. Gnidia chrysantha (*Solms*) *Gilg* (see p. 160)
A glabrous perennial plant up to 60 cm, stems erect, sparingly branched; leaves linear, 10–25 mm long; flowers bright yellow, capitate, terminal,

† By B. Peterson.

lens); fruits broadest at apex; flowers in terminal panicles; perennial 2. *B. diffusa*
Hairs on nodes and petioles small, less than 1 mm long, cells invisible under a hand lens; fruits broadest in the middle; flowers in terminal panicles or in pedunculate small cymes; annual 3
3 Prostrate herb; axillary peduncles (except the terminal ones) with one cyme of 3–5 flowers 3. *B. repens*
Prostrate or scrambling herb; axillary peduncles with 2 or more cymes 4. *B. coccinea*

1. Boerhavia erecta *L.*

An erect or ascending annual herb to 60 cm, pubescent on all parts except the inflorescence with usually ovate leaves and white to pale purple flowers.

A local weed of disturbed ground in the drier parts of our area. HT, MAG.

Glover and Samuel 2989.

2. Boerhavia diffusa *L.*

A spreading or prostrate perennial herb with ascending stems to 30 cm, pubescent and long-hairy on the nodes and petioles, often glabrous elsewhere with elliptic-suborbicular leaves and pink flowers.

An uncommon plant of roadsides and waste places in the drier lowland areas. MUM, KAJ, MAC.

Agnew and Musumba 8052; Agnew and Lind 5660.

3. Boerhavia repens *L.*

A prostrate finely pubescent annual with elliptic to oblong leaves and cream flowers.

An uncommon weed found on dry lands, often in alkaline soils. KIS, BAR, MAG, MAC.

Greenway 9020.

4. Boerhavia coccinea *Mill.* (see p. 160)

A prostrate or scrambling glandular pubescent annual herb with usually ovate leaves and pink flowers.

An uncommon plant found in cultivation edges and disturbed ground in the drier and possibly more saline areas. The distinction between this species and *B. repens* is not very good, and this species itself seems variable, with a heavily glandular variety, its inflorescences almost entirely axillary, (principally coastal but also found in MAC) and an almost glabrous variety with a big terminal panicle (found in BAR). KIS, BAR, MAC.

Leippert 5270; Brown in EAH 12806.

3. COMMICARPUS *Standl.*

Herbs, sometimes shrubby at base and scrambling; leaves opposite, petiolate, often undulate and thick; flowers in whorls (reduced from cymes), often apparently umbellate; sepals 5, tubular at base spreading into a white, yellow, pink or purple limb above, at base thickened in fruit and with variously arranged, sticky, sessile or stalked, warty, often black glands, and usually obscurely 10-ridged; stamens 2–5, usually exserted; ovary with a peltate, glabrous stigma.

1 Flowers at anthesis less than 4·5 mm long 1. *C. stellatus*
Flowers at anthesis more than 6 mm long 2
2 Entire plant with sticky glandular hairs; raised glands in several whorls on fruiting calyx 2. *C. boissieri*
Plant without sticky glandular hairs; fruiting calyx with only one apical whorl of raised glands 3
3 Flowers pink, purple, or magenta 3. *C. pedunculosus*
Flowers white or cream 4. *C. plumbagineus*

1. Commicarpus stellatus (*Wight*) *Berhaut*

A perennial pubescent (sometimes glandular) trailing herb with ovate leaves and white flowers.

A common plant in dry bush country especially in eastern Kenya. BAR, MAG, MAC, KAJ.

Bogdan 411; Hanid 566.

2. Commicarpus boissieri (*Heim.*) *Cuf.*

An erect or prostrate, densely glandular, pubescent perennial herb to 40 cm tall; with ovate to suborbicular leaves and purple flowers.

A sharply defined species which is extremely sticky all over and which grows in drier bushland. BAR, MAC, KAJ.

Verdcourt 1491.

3. Commicarpus pedunculosus (*A. Rich.*) *Cuf.*

A shortly pubescent trailing herb, sometimes scrambling or with ascending branches to 50 cm, with ovate to suborbicular leaves and magenta flowers.

A common plant of thickets and riverine areas in the dry country of eastern Kenya. HA, NAR, RV, NAN, EMB, MAC, NBI, KAJ.

Hanid and Kiniaruh 763; Glover, Gwynne and Samuel 818.

4. Commicarpus plumbagineus (*Cav.*) *Standl.*

Similar to *C. pedunculosus* in habit but with white flowers and stalked glands on the fruit.

This species is found in similar situations to, but often in drier regions than *C. pedunculosus*, and it appears to be the more common of the two

with ovate to lanceolate bracts, calyx-tube glabrous below the articulation, pubescent or glabrous above.

Rather common in vlei land. KIT.

Jex-Blake 1402; Symes 382.

6. Gnidia subcordata *Meisn.*

Much branched shrub up to 3·5 m. Dealt with in KTS p. 555. HT, HM, HL, HA, NAR, RV, NAN, NBI, KAJ.

7. Gnidia fastigiata *Rendle*

A low, shrubby herb with numerous little-branched stems from a woody base; leaves silky-hairy or glabrescent, linear-lanceolate; inflorescences with 1–3 cream or pale blue flowers.

Not uncommon in montane and subalpine grassland, 6000–9000 ft. HC, HT, HA.

Napier 1976; Irwin 231.

8. Gnidia buchananii *Gilg*

Suffrutescent plant with branched, glabrous stems to 50 cm; leaves 8–25 mm long, 2–5 mm wide, glabrous; inflorescences with 25–40 yellow flowers, bracts usually 5, quite glabrous, calyx-tube sparingly pubescent or glabrous above the articulation.

Rather common in grasslands. HC, RV, MAC, KAJ.

Ossent 283; Bally 11443.

9. Gnidia macrorrhiza *Gilg* (see p. 160)

Low, many-stemmed, unbranched, suffrutescent plant to 30 cm with glabrous, oblong-lanceolate leaves and terminal, bracteate inflorescences on leafless peduncles; flowers yellow or brownish-yellow.

Found in grassland. HT, KIT, BAR.

Dale 3176; Thorold 3247.

10. Gnidia apiculata (*Oliv.*) *Gilg*

Much branched woody herb up to 1 m; heads terminal and axillary with brownish, acute, involucral bracts; flowers yellow or greenish-yellow.

A rather variable species found in grasslands and on dry hillsides.

Archer 27; Rauh 328.

41. NYCTAGINACEAE†

Herbs, shrubs, or climbers, rarely trees with alternate or opposite simple exstipulate leaves; inflorescences mostly cymose; bracts present, bracteoles often absent; sepals usually 5, fused and petaloid, forming a sheath round the ovary in fruit; petals 0; stamens 1-many with the filaments often fused into a cup at base and the anthers with only 2 loculi; ovary 1-celled, with a style and capitate stigma, and with one erect ovule; fruit indehiscent; seed with some endosperm and a straight or curved embryo.

1 Woody climber with axillary thorns — 1. *Pisonia aculeata*
  Unarmed herbs — 2
2 Flowers more than 3 cm long; flowers and fruit enclosed in bracts — 4. *Mirabilis jalapa*
  Flowers less than 2 cm long; flowers and fruit not enclosed in bracts — 3
3 Fruiting calyx with large raised glands, especially at apex, obscurely 9–11-ridged; flowers in apparent umbels or verticillate — 3. *Commicarpus*
  Fruiting calyx with minute unicellular glands or glabrous, without glands, deeply 4–6-ridged; inflorescences terminating mostly in 3–5-flowered cymes — 2. *Boerhavia*

1. PISONIA *L.*

Dioecious climbers or shrubs or trees with alternate or opposite entire leaves and small greenish flowers in loose corymbs; male flowers with a short perianth with spreading lobes and 5–10 exserted stamens with joined filaments; female flowers with a longer narrower perianth, rudimentary stamens and a sessile elongated ovary; style exserted; stigma divided; fruit surrounded by the hard, often bristly perianth.

Pisonia aculeata *L.*

A woody climber with large spines axillary to the oblong, acute, glabrous leaves; fruit club-shaped, with 5 rows of gland-tipped bristles.

Recently discovered in Kakamega forest. MUM.

Faden 70/19.

2. BOERHAVIA *L.*

Herbs, often prostrate, with opposite petiolate entire leaves; flowers often in paniculate cymes; sepals 5, spreading into the pink to white limb (± 2 mm long in ours) directly above the ovary; stamens usually 2–3; fruit with 4–6 (usually) pronounced ridges, narrowing at apex, with minute sticky glands or glabrous, never with large warty glands.

1 Fruits glabrous, sharply obconical, truncate at apex — 1. *B. erecta*
  Fruits glandular, sticky, ellipsoid, tapered at the apex — 2
2 Hairs on nodes and petioles over 1 mm long, large-celled (cells can be seen with a hand

† By A. D. Q. Agnew.

5 Blade-glands all close to the axils of the nerves, rarely absent 1. *A. bequaertii*
Blade-glands never restricted to the nerve axils, sometimes absent 6

6 Leaves broadly ovate to orbicular, not lobed; nerves neatly arching towards the apex of the blade; venation distinct 2. *A. stolzii*
Leaves broadly ovate to orbicular, or ± triangular or bluntly 3–5 lobed; nerves ± straight, the upper pair ending in marginal glands, which are, in lobed leaves, the tips of the lobes 7

7 Leaves beneath with well-visible, finely netted, closed areolae between the large veins, on upper surface these reticulations well distinct 3. *A. gummifera*
Veins on lower surface of leaf distinctly less regularly and finely netted, with coarser areolae of larger and less equal size; on upper surface reticulations just discernible 4. *A. cissampeloides*

8 Flowers over 8 mm long; sepals partially connate into a calyx tube 9
Flowers less than 5 mm long; sepals free 14. *A. wightiana*

9 Plants with perennial stems, mostly shrubby climbers; leaves glabrous with entire margins; calyx lobes of male flowers entire or finely serrulate 10
Plants herbaceous or low climbers; leaves mostly pubescent with ± dentate margin, or lobed-laciniate; calyx lobes of male flowers long-woolly 13

10 Receptacle tube (between the base of the flower and the petals) less than 5 mm wide, much narrower than the calyx tube 11
Receptacle tube (between the base of the flower and the petals) 5–15 mm wide, about as wide as the calyx tube 12

11 Calyx tube of male flowers 10–25 by 5–12 mm; petals 10–18 mm long, feathery fimbriate; leaves ovate to suborbicular, with cordate to subtruncate base 7. *A. metriosiphon*
Calyx tube of male flowers (4–)5–10 by 3–5 mm; petals 5–9 mm, entire or serrulate; leaves ovate to oblong-lanceolate, with acute to rounded base 8. *A. lanceolata*

12 Anthers (5–)6–12 mm, much longer than the filaments; male flowers 10–35 mm long; fruits pear-shaped 9. *A. rumicifolia*
Anthers 3·5–5 mm, shorter than the filaments; male flowers 8–15(–20) mm long; fruits subglobular to ellipsoid 10. *A. schweinfurthii*

13 Plant erect, without tendrils; male flowers narrowed at the mouth, 8–18(–20) mm wide; corona present 14
Plant mostly provided with tendrils; male flowers long-tubular, 20–45 by 3–6 mm; corona absent; leaves lobed, rarely entire, rarely (sub-)glabrous; basal glands 2, situated on 2 auricles; anthers 5–6·5 mm 13. *A. ellenbeckii*

14 Leaves entire, more or less peltate; glands at blade-base 2, sessile; anthers 6–7 mm long 11. *A. keramanthus*
Leaves 3–7 lobed, very rarely subentire; glands at blade-base 2, each on an auricle; anthers 8–12 mm long 12. *A. volkensii*

1. Adenia bequaertii *Robyns & Lawalree*

Scrambling ± woody-stemmed herbs, or lianas; leaves entire, ovate, acuminate, grey-glaucous beneath; male flowers, including the 3–4 mm long stipe, 10–17 mm; hypanthium 2·5–4·5 mm wide; anthers 4–5 mm; female flowers 7–12 mm; fruits ovate, 3–5 x 2–3 cm.

Montane forests and scrub, 4500–7500 ft. HE, HM.

Jackson 433; Kerfoot 2836.

2. Adenia stolzii *Harms*

Lianas, ± woody-stemmed; leaves entire, orbicular to ovate with obtuse to acute apex, grey-glaucous beneath; male flowers, including the 2–3 mm long stipe, 12–15 mm; hypanthium 2–4(–5) mm wide; anthers 4·5–5 mm; female flowers *c.* 10 mm; fruits ovate-oblong, 4–4·5 x 2–2·5 cm.

Montane forests and scrub, 3000–6000 ft. HA.

R.E. and Th. C.E. Fries (1958) (UPS), a sterile specimen. The species is otherwise only known from the highlands of south-west Tanzania.

3. Adenia gummifera (*Harvey*) *Harms*

Large, woody lianas; leaves entire or up to halfway deeply 3-lobed, suborbicular to ovate or ± 3–5-angled in outline, with ± rounded (obtuse) apex, grey-green or glaucous beneath; male flowers, including the 2–8 mm long stripe, 11–20 mm; hypanthium 2–4 mm wide; anthers (3–)4–6 mm; female flowers 5·5–8 mm; fruits subglobular to ovate, 2·5–4 x 1·75–3 cm.

Often a vigorous climber in savannas, forest edges, and on stony slopes 0–5500 ft. HN, KIT, MUM, MAC, NBI.

Agnew 7439; Verdcourt and Polhill 12117.

4. Adenia cissampeloides (*Benth.*) *Harms*

Climber up to 25 m long; leaves entire, suborbicular to faintly 5-angular, pale green to greyish-green beneath; leaf apex obtuse; male flowers,

in the Rift Valley. MUM, KIS, BAR, RV, EMB, MAC, KAJ.

Hanid and Kiniaruh 750; Glover 4035.

4. MIRABILIS *L.*

Much-branched herbs with opposite simple leaves; inflorescence of terminal ± crowded cymes; flowers large, brightly coloured, surrounded by a calyx-like involucre of fused bracts; sepals totally petaloid with a long tube and a wide limb which separates from the expanded globose hard lower portion in fruit; stamens 5, fused into a short tube at the base of the filaments, which is usually persistent in fruit; fruit a hard globose 'nut' contained within the enlarged bracts.

Mirabilis jalapa *L.*

An erect dichotomous annual, sparsely pubescent at the nodes with ovate-acuminate leaves and yellow, pink, or magenta flowers.

An escaped garden plant, especially around Nairobi, though also recorded elsewhere; originally from Peru. HT, NBI.

Williams 417; Agnew 7611.

42. PASSIFLORACEAE†

Climbers with tendrils and usually palmately lobed stipulate, alternate leaves; flowers bisexual, usually in racemes or solitary, usually with a receptacular tube surrounding the base of the ovary; sepals 5, free; petals 5, free, or absent, often with a corona in 1-2 series; stamens 5; ovary of 3 carpels, with parietal placentation and many ovules; styles 3; stigmas capitate; fruit a berry or baccate capsule; seeds with much endosperm and a large embryo.

1 Flowers unisexual; plants spiny and/or leaves with large glands at top of petiole — 1. *Adenia*
Flowers bisexual; plants never spiny nor with large glands at top of petiole — 2
2 Tendrils simple; flowers solitary, more than 3 cm in diameter — 2. *Passiflora*
Tendrils bearing inflorescences or at least with short branches; flowers less than 1·5 cm in diameter — 3. *Tryphostemma*

1. ADENIA *Forsk.*

Herbs, shrubs or climbers, often with tendrils, often growing from a perennial rootstock or tuber; stipules minute, long-triangular or reniform; leaves alternate, simple, entire or lobed with 1-2 glands at the blade-base, on or near the apex of the petiole; tendrils axillary; inflorescences axillary, cymose, the middle (or the first three) flowers replaced by tendrils or not; flowers dioecious or rarely monoecious (outside Kenya sometimes bisexual or polygamous), mostly greenish to yellowish; flower stipe articulate at the base; sepals usually 5, free or partially connate into a tube, imbricate, persistent; petals usually 5, free, included in the calyx; corona (marking the upper rim of the ± cup-shaped receptacle tube, and often also present on the 5 septa connecting the hypanthium and the filament tube, opposite the petals) annular, or consisting of 5 cup-shaped parts or of a row of filamentous processes or hairs, or absent; disk-glands 5, capitate, inserted mostly at the bottom of the receptacle tube, alternating with the petals or absent; male flowers with stamens 5, inserted at the base of the hypanthium, free or partially connate into a tube; female flowers with superior shortly stipitate, subglobular to oblong, 1-celled ovary with 3 parietal placentas; ovules usually numerous; staminodes ± subulate; styles 3, free or partially united; stigmas reniform to subglobular, laciniate or plumose to densely woolly-papillose; fruit a stipitate 3-valved capsule, coriaceous to rather fleshy, greenish to bright red; seeds ± compressed, with crustaceous pitted testa, enclosed in a pulpy aril; endosperm horny; embryo large, straight; cotyledons foliaceous.

Male plants are more frequently found than female specimens. Most species are not common.

1 Shrubs (erect or scrambling) with many stems springing from a massive green globose or cylindrical tuber-like stem — 2
Shrubs or herbs, climbers or erect, with normal stems springing from the ground, never from a massive green base — 4
2 Plants with spiny branches — 3
Plants unarmed — 5. *A. venenata*
3 Main branches climbing or scrambling, not erect; thorns as long as or longer than the internodes; inflorescences scattered; seeds 3-6 per fruit — 6. *A. globosa* ssp. *globosa*
Main branches erect; thorns shorter than or as long as the internodes; inflorescences on branch apices; seeds 15-25 per fruit — 6. *A. globosa* ssp. *pseudoglobosa*
4 Gland at blade-base on a single, distinct, median, semi-hemispherical to spathulate narrowly attached appendage; corona absent or entire, or as 5 cup-shaped parts, or as a fleshy rim, never laciniate or composed of hairs; disk-glands absent from the flower — 5
Gland(s) at blade-base 1 or 2, (sub-)sessile, on the more or less peltate blade-base or on two auricles, never on a distinct spathulate appendage with narrow insertion; corona absent, or laciniate or consisting of (woolly) hairs; disk-glands present — 8

† By A. D. Q. Agnew and W. J. J. O. de Wilde (*Adenia.*).

or dissected, with acute apex, mostly finely pubescent; flowers urceolate to broadly tubular-campanulate; male flowers including the 2–8 mm long stipe 20–35(–45) mm; anthers 8–12 mm; female flowers 16–25 mm; fruits ± fleshy, subglobose to ellipsoid, 3·5–5 x 3–4·5 cm.

Shrub vegetation, rocky places, 3000–6000 ft. HA, RV, MAG, NAN, EMB, MAC, NBI, KAJ.

Adamson 520; Bally 1052.

13. Adenia ellenbeckii *Harms*

Resembling *A. volkensii* but mostly with more slender shoots and flowers and provided with tendrils; male flowers including the 1–3 mm long stipe 20–45 mm; anthers 5–6·5 mm; female flowers, including the 1–3 mm long stipe, 12–30 mm long; fruits subglobose, more or less fleshy, 2–4(–5) x 2–4(–4·5) cm.

Rocky places; open shrub-vegetation, 600–4500 ft. KAJ.

Greenway and Duvigneaud 12.622.

14. Adenia wightiana (*W. & A.*) *Engl.*

A perennial climber up to 8 m long; leaves variable, sub-orbicular to 3–5 lobed, with acutish apex and irregularly sinuate-dentate margin; male and female flowers ± alike, minute, including the (0·5–)1–2 mm long stipe 3–5 mm; anthers *c.* 0·5 mm long; fruits ovoid to ellipsoid, 1·5–3 x 1·25–2 cm.

Scrub-savanna and forest fringes, 3000–5500 ft. KAJ. Bally 8002; Greenway 5990.

2. PASSIFLORA *L.*

Climbers with branched or unbranched tendrils and usually palmately lobed or divided leaves with broad stipules; flowers usually solitary, axillary, with 3 bracts at base; sepals and petals 5, with a long or short petal tube, and a single corona of capillary filaments; stamens 5 borne beneath the ovary at the top of the gynophore; fruit an indehiscent berry, the seeds surrounded by a pulpy aril, often long-stalked.

A large genus of South American species some of which are grown as ornamentals or for their fruits and which have occasionally escaped. The following has been found wild in two areas in Kenya.

Passiflora eichlerana *Masters*

A glabrous climber with unbranched tendrils and tripalmatifid leaves with ovate lobes; bracts ovate to cordate at base; flowers white; fruit green, hardly juicy.

An escape found on disturbed ground recorded from Nairobi and Kericho. HM, MAC, NBI.

Hanid 46; Kerfoot 4874.

3. TRYPHOSTEMMA *Harv.*

Climbing or erect herbs or shrubs with entire or palmatifid, (usually 3-lobed) leaves with capillary stipules; inflorescences of short, axillary, 2-flowered racemes, the rachis continued into an apically thickened tendril; flowers bisexual, often small; sepals and petals 5, free, spreading; corona double, the outer fringed with numerous capillary appendages, separated from the inner by a disc, the inner simple, connate to the filaments within; stamens 5; fruit capsular, inflated, ellipsoid, stalked.

1 Leaves simple, linear-oblong 1. *T. longifolium*
Leaves palmately lobed 2
2 Leaf lobes elliptic, broadest about the middle or above, glabrous below 2. *T. hanningtonianum*
Leaf lobes lanceolate, broadest below the middle, sometimes hairy below 3. *T.* sp. *A*

1. Tryphostemma longifolium *Harms*

A glabrous perennial with several ± unbranched ascending or erect stems to 40 cm from a woody rootstock and simple oblong obscurely dentate leaves; fruit 25–30 mm long.

A rare plant of dry places in the eastern lowlands of our area, and only recorded from the foot of the Chyulu Hills. KAJ.

Bally 8000.

2. Tryphostemma hanningtonianum *Masters*

A low glabrous climbing (or sometimes erect) annual with tripalmatifid leaves bearing elliptical obtuse lobes; fruit narrow, to 20 mm long.

Locally common in the bushland edges of the dry country to the east of our area. MAC.

Lind and Agnew 5649; Ossent 237.

3. Tryphostemma *sp.* A.

Similar to *T. hanningtonianum* but more robust, and with an indumentum; fruit to 16 mm long.

A rare plant, only found once in our area, at Donyo Sabuk, and also known from the coast, in forest edges and clearings. MAC.

Napper, Lind, Agnew, and Beecher 1716.

43. CUCURBITACEAE†

Mostly climbers with tendrils opposite the mostly palmatifid, serrate or dentate, alternate exstipulate leaves; probracts sometimes present at the base of

† By A. D. Q. Agnew.

including the 2-4 mm long stipe, 10-15 mm; hypanthium 2-3 mm wide; anthers 3·5-5 mm; female flowers 6-10 mm; fruits broadly ovate to ellipsoid or ± fusiform, 2-3·5 x 1·5-2·5 cm.

Forests and forest-edges, gallery forest, 0-4500 ft. MUM (Kakamega forest). The species has its main distribution in tropical West Africa.

Maas Geesteranus s.n. (WAG).

5. Adenia venenata *Forsk.*

Climbers or shrublets, the branches growing from a pachypodous, fleshy, ± tapering trunk; leaves orbicular to broadly ovate, in outline shallowly to deeply 3-5(-7)-lobed, lobes with rounded apex; flowers in subsessile inflorescences along very short lateral shoots; male flowers ± infundibuliform, (20-)30-56 mm, the tube 2-3 mm wide; anthers 4-6 mm; female flowers 15-24 mm, the tube 3-4 mm wide; fruits ovate to ellipsoid-fusiform, often coarsely greenish- to purplish-veined, 2-4·5 x 1·5-3 cm.

Often leafless plants of savannas and steppe, scrub-vegetation, 0-4500 ft. HC, KIS, BAR, MAG.

Bally 12351; Harmsen 6476.

6. Adenia globosa *Engl.*

Straggling climber or with erect stems amongst other shrubs from a thick rock-like trunk; stems strongly thorny by transformed lateral twigs; leaves minute, caducous; inflorescences sessile, grouped in bundles or on short twigs axillary to the thorns along the shoots; flowers infundibuliform, the males 19-30 mm long; anthers 6-8 mm; female flowers (6-)8-12 mm; fruits sub-globular to ellipsoid, 1-1·8 cm long.

ssp. globosa

Dry rocky places in scrub-savanna, up to 4500 ft. MAC, KAJ.

Bally 12797; Opiko 309.

ssp. pseudoglobosa (*Verdc.*) *de Wilde*

Similar to the above except for the key characters, and confined to the Rift Valley.

Dry scrub and stony places, 2600-5600 ft. RV, MAG.

Bally 8639; Bogdan in EAH 77/60.

7. Adenia metriosiphon *de Wilde*

Slender, woody climber; leaves entire, suborbicular to ovate, with obtuse to sub-acute, mucronate apex; flowers ± tubular-urceolate, the males including the 4-4·5 mm long stipe 20-38 mm; petals densely feather-like, fimbriate; anthers 5·5-7 mm, mucronate; female flowers 15-20 mm; fruits subglobular, slightly fleshy, 4-5 x 3·5-4·5 cm.

Forest edges and scrub, 4500-6800 ft. Endemic to Kenya. HA, RV, MAC, NBI, KAJ.

Archer 11939; Napier 3244.

8. Adenia lanceolata *Engl.*

Trailing or suberect, herbaceous to woody plants, growing from a tuberous rootstock; leaves entire, ovate or obovate to lanceolate, with acute to obtuse apex; flowers more or less tubular, the males including the 1-6 mm long stipe 17-26 mm, the females 10-22 mm long; anthers 3·5-5 mm; fruits ovate-ellipsoid, 2-4 x 1·5-2·5 cm.

A variable species, growing in savannas, open woodland, rocky places, 1800-4000 ft. The roots are known as poisons. MAC, KAJ.

Battiscombe 887; Bally 7507.

9. Adenia rumicifolia *Engl. & Harms*

Robust, ± woody climber, sometimes with winged stems; leaves mostly large, mostly ± ovate, entire or shallowly 3-lobed, with acute apex; flowers large, broadly urceolate-campanulate, the males 15-35 mm; female flowers slightly smaller; anthers 6-12 mm, distinctly apiculate; fruits pear-shaped, 3-5 x 1·5-3 cm.

Forest edges, thickets, marshy gallery forest, 0-5500 ft. MUM, EMB.

Dale 3396; R. E. and Th. Ch. Fries 1958a.

10. Adenia schweinfurthii *Engl.*

Resembling *A. rumicifolia* but with mostly smaller, suborbicular leaves, and with smaller flowers, measuring (8-)10-15 mm; anthers 3·5-5(-6) mm, apiculate or not; fruits globular to ellipsoid, 3·5-5(-6) x 2·5-4 cm.

This climber has been found near Lake Victoria in secondary forest at 5300 ft. MUM.

Gillett 16701.

11. Adenia keramanthus *Harms*

Erect herb or shrublet without tendrils, up to 1 m tall, with a succulent main stem and branches; leaves suborbicular to ovate, densely pubescent, with ± rounded apex and dentate margin; flowers broadly tubular-urceolate; male and female flowers ± alike, 17-26 mm long, stipe 1-3 mm; anthers 6-7 mm; fruits ± fleshy, subglobose, 3·5-5 by 3-4·5 cm.

Rocky bushland, open woodland, up to *c.* 3000 ft. KAJ.

Bally 8660; Verdcourt 1850.

12. Adenia volkensii *Harms*

Herb or shrublet, without tendrils, 0·3-1·5 m tall from a buried tuber; leaves suborbicular to broadly ovate in outline, mostly deeply 3-7-lobed

subglobose or obconic in the male flower, forming a ring around the style in the female flower; stems rough hispid-hairy; male flowers solitary or fascicled 25
Disc not as above, obscure and not distinct from the walls of the ovary; stems usually not hispid-hairy but if so then male flowers in pedunculate racemes 27

25 At least the growing points with stiff brown hairs 11. *Oreosyce africana*
No stiff brown hairs on young parts 26

26 Male flowers solitary or 1–2 together; fruits often warted or spiny, usually more than 3 cm long 10. *Cucumis*
Male flowers 3–9 together, sometimes with a short peduncle; fruits smooth, often less than 3 cm long 12. *Cucumella engleri*

27 Flower from base of tube to top of petals less than 10 cm long 28
Flower from base of tube to top of petals more than 10 cm long 29

28 Male flower with a bract at base of pedicel; ovary with no basal cup 16. *Kedrostis*
Male flower with no bract at base of pedicel, or sometimes bract adherent to pedicel to half way; ovary developing a basal cup 17. *Corallocarpus*

29 Male flower with oblong sepals, over 2 mm broad; ovary hairy 1. *Momordica boivinii*
Male flower with much narrower sepals; ovary glabrous 3. *Coccinia*

30 Fruit cap separating pixidately from the cup-like base 17. *Corallocarpus*
Fruit cap not separating from base, either indehiscent or longitudinally valvate 31

31 Fruit beaked at apex (i.e. gradually narrowed into a point) 32
Fruit rounded at apex, not beaked 35

32 Fruit narrowed at base and apex 33
Fruit beaked at apex only 16. *Kedrostis*

33 Fruit stalk longer than 2·5 cm; stems not scabrid-hairy 1. *Momordica boivinii*
Fruit stalk shorter than 2·5 cm; stems scabrid-hairy 34

34 Fruit finely hairy 12. *Cucumella engleri*
Fruit glabrous 14. *Zehneria minutiflora*

35 Fruit globose or subglobose 36
Fruit ellipsoid to cylindrical to ovoid 39

36 Fruit glabrous 37
Fruit hairy 38

37 Fruit more than 15 mm long 3. *Coccinia microphylla*
Fruit less than 15 mm long 14. *Zehneria*

38 Fruit with fleshy protuberances and often with brown hairs 11. *Oreosyce africana*
Fruit smooth, without brown hairs 10. *Cucumis hirsutus*

39 Fruit ornamented with fleshy or spiny protuberances 40
Fruit smooth 41

40 Fruit densely hairy on the fleshy lobes 11. *Oreosyce africana*
Fruit glabrous or sparsely hairy 10. *Cucumis*

41 Stems rough-hairy; fruit often narrowed towards the base 12. *Cucumella engleri*
Stems almost glabrous, except for a few large spiny hairs sometimes present, smooth; fruit rounded at base 42

42 Seeds white, inflated, without a margin, almost globose 8. *Trochomeria macrocarpa*
Seeds cream, flattened, with a margin 3. *Coccinia*

1. MOMORDICA *L.*

Dioecious or monoecious herbaceous to woody climbers with a swollen or woody rootstock, tendrils simple or bifid near the base, and simple or divided leaves; flowers large, white to orange, often with black or orange spots of colour on sepals or petals; male flowers usually sub-umbellate, rarely solitary, often with a prominent suborbicular sheathing bract; receptacle tube short and broad with an incurved scale between each adjacent pair of filaments at base; petals free; stamens 3 (2 double 2-thecous, 1 single 1-thecous) or 2 (1 triple (2-) 3-thecous, 1 double 2-thecous), usually free, with the thecae curved, doubled or triplicate; female flowers solitary; ovules horizontal or pendulous or erect; fruit usually ellipsoid, often ornamented, red or orange, fleshy, indehiscent or dehiscent and 3-valved; seeds compressed with characteristic sculpturing in the thickened testa.

These plants usually have a nasty foetid smell when crushed.

1 Leaves simple 2
Leaves compound palmate or ternate 5

2 Paired spines at leaf base present 1. *M. spinosa*
Paired spines absent 3

3 Young stems spotted with darker green 2. *M. foetida*
Young stems concolorous 4

4 Sinus at leaf base wide, concave-semicircular on each side of the insertion of the petiole 3. *M. calantha*
Sinus at leaf base acute at insertion of petiole 4. *M. boivinii*

5 Young stems flecked with darker green 5. *M. cissoides*
Young stems concolorous 6

the axillary branches; flowers unisexual, regular, obscurely or markedly zygomorphic on dioecious or monoecious plants, commonly racemose or solitary; receptacle of flower forming a tube (called simply the 'tube' or 'receptacular-tube' in the following generic descriptions) at the base of the flower, with 5 free sepals present as lobes at its apex and 5 free or connate petals; stamens basically 5, alternate with the petals, inserted at the top of or within the tube, but variably connate (often in 2 pairs with 1 free) to form a morphologically zygomorphic, functionally regular androecium, the thecae (pollen sacs) often contorted and folded; female flowers with an inferior ovary, with parietal (or rarely axillary) placentation, of mostly 3 carpels, with staminodes often on the tube above; stigmas 3 or 3-lobed; fruit usually a fleshy indehiscent berry, more rarely a dehiscent berry, dehiscent dry capsule or indehiscent samara.

A rather difficult family to deal with since the male and female flowers may not be found together, and these have the most important characters for identification. The leaves are characteristic but in fact are always difficult to describe and often variable.

1 Plants spiny, the spines mostly paired at the nodes — 1. *Momordica spinosa*
Plants unarmed — 2
2 Plants without tendrils — 15. *Myrmecosicyos messorius*
Plants with tendrils — 3
3 Tendrils bifid at apex, spiralling above and below the point of branching; plants ± glabrous, with very zygomorphic flowers, dry capsules and winged seeds — 18. *Gerrardanthus lobatus*
Tendrils simple or only spiralling above the branching point; fruits always succulent — 4
4 Tendrils divided into 3–5 branches — 5. *Luffa cylindrica*
Tendrils simple or bifid — 5
5 Leaves compound or stems spotted and streaked with darker green — 1. *Momordica*
Leaves simple; stems uniformly green without darker spots — 6
6 Tendrils bifid — 7
Tendrils simple — 16
7 Petiole bearing a pair of glands at apex, or on the base of the lamina — 2. *Lagenaria*
Petiole without a pair of apical glands — 8
8 Male or female flowers present — 9
Fruits present — 12
9 Flowers over 4 cm long in last bud stage — 6. *Peponium vogelii*
Flowers and buds under 4 cm long — 10
10 Recurved scales at base or petals closing the receptacle tube between the filaments; flower orange and black or white and black — 1. *Momordica*
Recurved scales absent between filament bases; no black on flower — 11
11 Peduncles of male racemes shorter than the pedicels or racemes sessile; ovary glabrous — 4. *Diplocyclos*
Peduncles of male racemes longer than petioles and pedicels; ovary hairy — 16. *Kedrostis hirtella*
12 Ripe fruit hairy — 13
Ripe fruit glabrous or becoming glabrous — 15
13 Fruit narrow-cylindrical, pointed at both ends — 1. *Momordica boivinii*
Fruit broader, rounded at both ends — 14
14 Fruit setose to lanate, not densely velvety — 6. *Peponium vogelii*
Fruit densely velvety — 1. *Momordica calantha*
15 Fruit more than 4 cm long, with a long cylindrical beak at apex — 16. *Kedrostis hirtella*
Fruit less than 3 cm long, rounded at apex or with a short conical beak — 4. *Diplocyclos*
16 Leaves ± sessile, clasping the stem, pinnatifid or sinuate above — 7. *Cephalopentandra ecirrhosa*
Leaves petiolate, not clasping the stem, always palmatifid — 17
17 All flowers sessile — 13. *Mukia maderaspatana*
At least some flowers with appreciable pedicels — 18
18 A suborbicular stipuliform bract present at the base of the petiole — 19
No stipuliform bract present, or if present, then not suborbicular — 20
19 Petals linear, more than 10 mm long; seeds rounded — 8. *Trochomeria macrocarpa*
Petals triangular, less than 2 mm long; seeds angular — 9. *Dactyliandra nigrescens*
20 Tendrils more than 1 at each node; fruits buried underground — 10. *Cucumis humifructus*
Tendrils but 1 at each node; fruits not buried — 21
21 Flowers, male or female, present — 22
Fruits present — 30
22 Receptacle tube more than 13 mm long, narrow-cylindrical; petals linear, tapering from the base — 8. *Trochomeria macrocarpa*
Receptacle tube shorter, not narrow-cylindrical; petals broader — 23
23 Flowers white, turning yellow with age — 14. *Zehneria*
Flowers yellow or green — 24
24 Disc at base of receptacle tube prominent, free from tube laterally and elevated and

6 Tendrils simple; leaflets ± rounded at apex, glabrous 7
Tendrils simple or bifid, leaflets ± acute at apex pubescent 8
7 Female flowers subsessile; fruit-stalk less than 15 mm long; male racemes with or without an inflated bract around the numerous buds 6. *M. rostrata*
Female flowers with pedicels over 14 mm long; fruit-stalk over 2 cm long; male racemes with an inflated bract around the solitary flower 7. *M. trifoliolata*
8 Bract of male racemes longer than broad, less than 2·5 cm long; receptacle-tube of male flowers over 9 mm long; seeds ± globose 8. *M. friesiorum*
Bract of male racemes broader than long, usually more than 2·5 cm long; receptacle tube of male flowers less than 7 mm long; seeds flattened 9. *M. pterocarpa*

1. Momordica spinosa (*Gilg*) *Chiov.*

Dioecious, tuberous-rooted, pubescent decumbent spiny shrub or climber, the spines in pairs at the nodes of older stems being the thickened blunt persistent bases of the paired tendrils and/or petioles.

An uncommon plant found in dry *Commiphora* bushland, only recorded from MAC and KAJ.

Bally 8741.

2. Momordica foetida *Schumach.* (see p. 169)

Dioecious pubescent perennial climber or trailer with a woody rootstock, simple or bifid tendrils and dark-green-spotted stems.

The common *Momordica* of forest edges, cultivation and disturbed places in wetter regions in Upland Kenya up to 7000 ft. HE, HC, HT, HM, HL, HA, HK, KIT, MUM, KIS, MAC, NBI, KAJ.

Agnew and Hanid 7906; Nattrass 920.

3. Momordica calantha *Gilg*

Monoecious pubescent climber with bifid tendrils.

An uncommon plant, but found near Nairobi in forest margins. HA, HK, NBI.

Napier 5741; Agnew 8285.

4. Momordica boivinii *Baill.* (see p. 172)

Monoecious or dioecious, pubescent climber or trailer, with a tuberous (often globose) rootstock and simple or bifid tendrils.

Common in the *Combretum* bushland area of Machakos district, creeping amongst the grass and also known from the coast. MAC.

Tweedie 67/78; Kirrika 138.

5. Momordica cissoides *Planch*

Dioecious pubescent perennial climber or trailing herb with dark-green-spotted stems and simple tendrils.

A rare plant of lowland wet forest and only found at forest edges of MUM in our area.

Rogers 708.

6. Momordica rostrata *A. Zimm.*

Dioecious woody perennial climber with perennial white-barked stems from a fleshy rootstock which often shows above the soil surface, and simple tendrils.

Common in the drier parts of *Commiphora* woodland areas and rocky places in grassland below 5500 ft. RV, MAG, MAC, KAJ.

Agnew 7773; Glover 3969.

7. Momordica trifoliolata *Hook. f.*

Dioecious herbaceous perennial climber with annual pubescent stems and simple tendrils.

A plant of riverine borders in the dry lowlands and coast of Kenya, and only known from our area by one specimen collected at Kitui. MAC.

Rauh 815.

8. Momordica friesiorum (*Harms*) *C. Jeffrey* (see p. 169)

Dioecious or monoecious pubescent perennial climber with tuberous rootstock and bifid tendrils.

A common plant of upland forest and wetter bushland 3500–8500 ft. HE, HC, HT, HM, HA, HK, HN, NAR, RV, NBI, KAJ.

Strid 3108 B; Archer 81.

9. Momordica pterocarpa *A. Rich.*

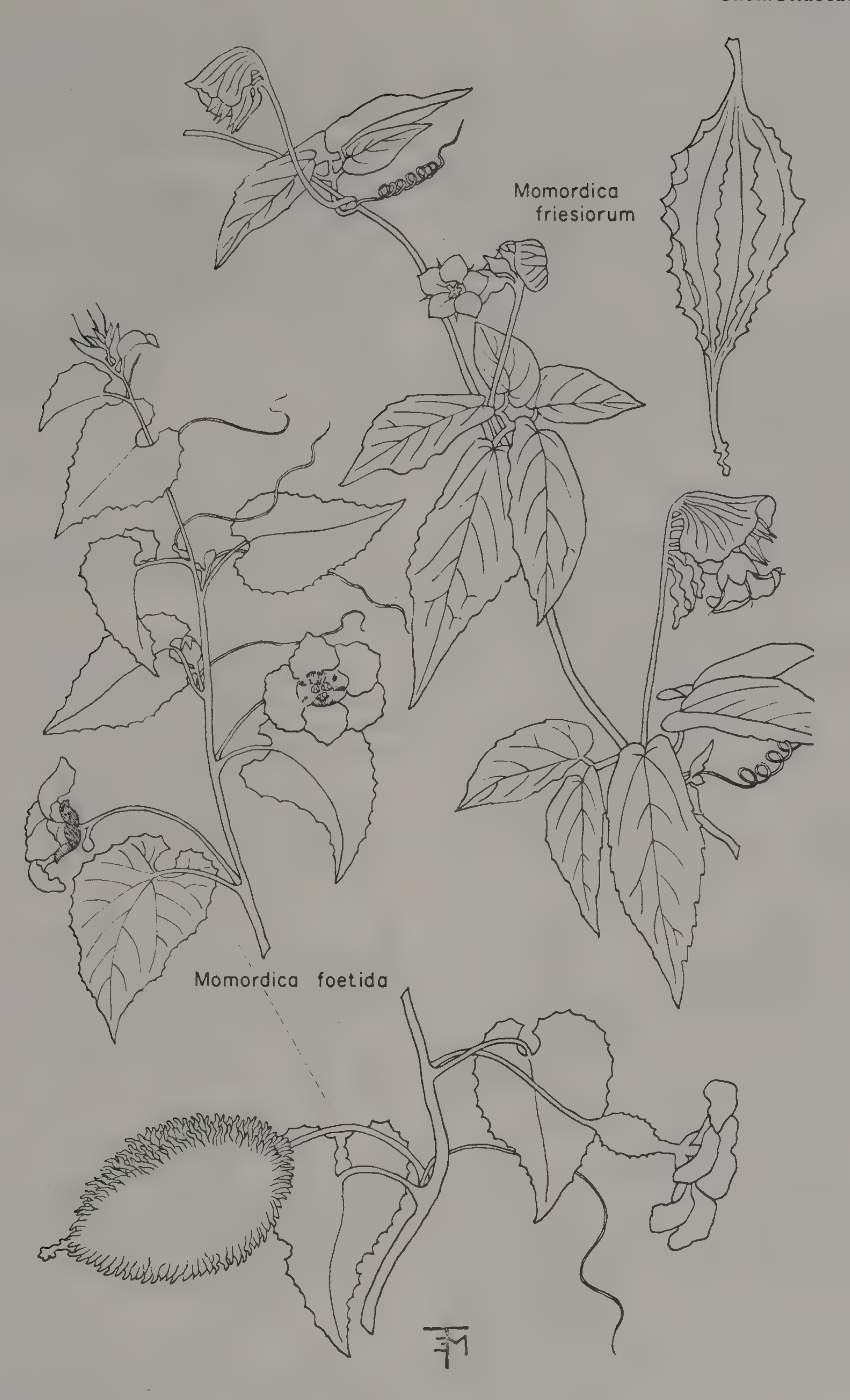
Monoecious or dioecious pubescent perennial climber from a tuberous rootstock, with (sometimes weakly) bifid tendrils.

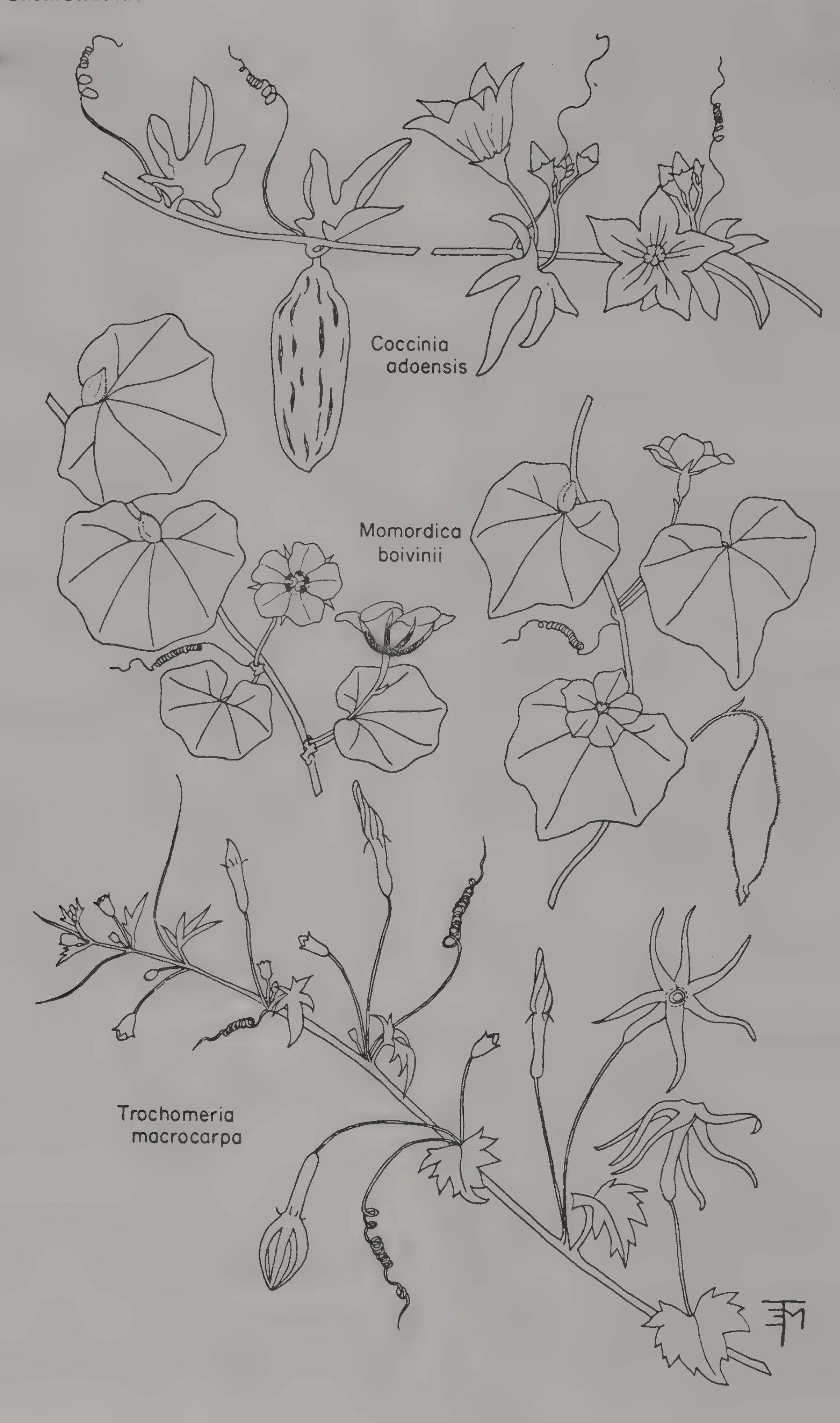
A local plant so far found in Kenya only in the forest relicts in the triangle bordered by Kikuyu–Ngong–Thika. HA, MAC, NBI.

Strid 2571; Bally 9220 (May 1938).

2. LAGENARIA *Ser.*

Robust climbers with simple leaves bearing a pair of glands at the apex of the petiole, and simple or bifid tendrils; male flowers solitary or racemose, large, the tube obconic to long-cylindrical and the petals free, spreading; stamens 3 (2 double 2-thecous, 1 single 1-thecous) with free filaments but often coherent anthers and contorted, triplicate thecae; female flowers solitary, with a very short tube; fruit large, hard-shelled, mainly globose, indehiscent; seeds horizontal, compressed,


Momordica
friesiorum
Momordica foetida


Coccinia
adoensis
Momordica
boivinii
Trochomeria
macrocarpa

smooth, flat on the disc, with 2 flat submarginal ridges on either side.

1 Glands at the apex of the petiole strong, sticking out from the petiole at right angles to it 2
Glands at the apex of the petiole weak, difficult to see, mostly on the base of the lamina, always directed downwards, parallel with the petiole 3
2 Receptacle-tube of male flower over 24 mm long; leaves glabrous beneath except for the major nerves 3. *L. breviflora*
Receptacle-tube of male flower under 12 mm long; leaves puberulous beneath 2. *L. sphaerica*
3 Receptacle-tube of male flower over 23 mm long; leaves usually prominently lobed, the lobes narrowed at the base 4. *L. abyssinica*
Receptacle-tube of male flower under 16 mm long; leaves obscurely lobed, and if lobed then the lobes widest at the base 1. *L. siceraria*

1. Lagenaria siceraria (*Molina*) *Standley*

Monoecious climbing herb with bifid tendrils and glabrous to lanate stems, leaves with the glands at the base of the ± reniform lamina very short-conical, usually shorter than the indumentum and directed downwards along the petiole.

This is the cultivated bottle-gourd, which is apparently wild in some upland grassland and bushland in our area up to 6000 ft. KIS, KIT, HA, NBI.

Bally 7354.

2. Lagenaria sphaerica (*Sond.*) *Naud.*

Dioecious climbing herb with bifid tendrils similar to *L. abyssinica*, but with robust conical glands at junction of petiole with lamina, projecting at right angles to the petiole.

Riverine vegetation in drier districts below 6000 ft is favoured by this species. MUM, EMB, MAC.

Hanid and Kiniaruh 1051; Glasgow 46/38.

3. Lagenaria breviflora (*Benth.*) *G. Roberty*

Dioecious climber with glabrous stems and often bifid tendrils, the leaves with prominent conical glands at tip of petiole.

A rare plant found only once in Kenya at Kakamega. MUM.

Strid 2919.

4. Lagenaria abyssinica (*Hook. f.*) *C. Jeffrey*

Dioecious climber, often robust, with annual stems and bifid tendrils and with palmate leaves, the petiole glands small, tubular and pointing downwards.

The commonest *Lagenaria*, growing from bushland riverine forest to bamboo subalpine zones and in fact found wherever there are trees and water, 5000–9000 ft. HE, HC, HM, HA, HN, KIT, NAR, NBI, KAJ.

Strid 3620; Symes 96.

3. COCCINIA *Wight & Arn.*

Perennial climbers, usually from a tuberous rootstock, with simple leaves and simple or proximally bifid tendrils; flowers on separate plants, the males often racemose, orange-yellow to yellow; receptacle tube short, campanulate or funnel shaped; patals fused; stamens mostly 3 (all 2-thecous, or two 2-thecous, one 1-thecous) the filaments inserted near the top of the tube, the anthers and sometimes filaments connivent into a head in the centre of the flower, and with the thecae triplicate and often convoluted; ovary with horizontal ovules; fruit fleshy, cylindrical to globose, smooth, with a thin pericarp; seeds compressed ovate, not ornamented.

1 Leaves broader than long (measured from the top of the petiole to the top of the centre lobe); free petal lobes longer than the petal tube above the calyx 2
Leaves longer (from the top of the petiole) than broad; free petal lobes shorter than the petal tube above the calyx 1. *C. adoensis*
2 Leaves glabrous on lower side, ornamented on upper side with transparent hair-bases only; fruit concolorous, without clearly outlined darker or lighter streaks and blotches 2. *C. grandis*
Leaves hairy below, and often roughly so on upper side; fruit with streaks and blotches of lighter colour 3
3 Stems annual, remaining concolorous; fruit cylindrical or ellipsoid 3. *C. trilobata*
Stems perennial, becoming white-spotted by bark formation while still young; fruit subglobose or ellipsoid 4. *C. microphylla*

1. Coccinia adoensis (*A. Rich.*) *Cogn.* (see p. 172)

A perennial climber with a woody rootstock as well as root tubers, strigose-pubescent on all parts, stems annual, possibly rarely perennial, and with leaves ovate in outline, divided into seven oblong or even linear lobes.

Rare around Nairobi, this plant becomes very common in the north-west of our area, mainly in highland *Acacia* grassland. HE, HC, HT, HM, HA, KIT, MUM, MAC, KAJ.

Strid 2233; Polhill and Paulo 1013.

7. CEPHALOPENTANDRA *Chiov.*

Dioecious tuberous-rooted climber with simple tendrils and pinnatifid sessile leaves; male flowers 1–2 together, with receptacle-tube cylindrical below, widened above, corolla lobes connate below, and 3 stamens (all 2-thecous) with triplicate thecae; female flowers solitary; fruit ellipsoid, smooth, fleshy, red; seeds horizontal, compressed with a concave disc, testa warted.

Cephalopentandra ecirrhosa (*Cogn.*) *C. Jeffrey*

Perennial glabrous climber from a hemispherical or elongate fleshy tuber projecting above the soil surface; sessile leaves of two types, one deeply pinnatifid with acute lobes, the other shallowly lobed, the lobes rounded and all leaves ± elliptic in outline.

In dry subdesert bushland and only recorded from Isiolo in our area. NAN.

Ritchie 1397.

8. TROCHOMERIA *Hook. f.*

Perennial dioecious herbs with root tubers, often climbing with simple tendrils, sometimes erect without tendrils, with annual stems and simple leaves; flowers with an elongated cylindrical receptacle tube, minute sepals and long, tapering petals; male flowers in clusters at nodes, pedunculate or not, with 3 stamens (2 double 2-thecous, 1 single 1-thecous) the anthers united into an oblong head within the tube, and with triplicate thecae; fruit fleshy, indehiscent, red; seeds large, subglobose, whitish, usually smooth and not sculptured.

Trochomeria macrocarpa (*Sond.*) *Hook. f.* (see p. 172)

Climbing or more usually trailing pubescent plant from a woody rootstock, with the leaves ± orbicular in outline usually deeply palmatifid to palmatisect.

A common plant of grassland in *Combretum* country. HC, HT, HA, KIT, MAC.

Polhill 414; Agnew and Tweedie 9289.

9. DACTYLIANDRA *(Hook. f.) Hook. f.*

Climbing herbs with annual stems and divided simple leaves, each with an expanded stipuliform bract at the base of the petiole; flowers as in *Diplocyclos* but the corolla free, small and with a (concave) disc present in the male flower; fruit globose, red, indehiscent, with a few horizontal seeds; seed with a smooth, thick testa with flat faces and angular margin.

Dactyliandra nigrescens *C. Jeffrey*

Strigose climber resembling *Diplocyclos palmatus* except for the usually 10 mm long suborbicular dentate stipuliform bract at each node.

A rare endemic only recorded from Isiolo, just inside our area in NAN, possibly also to be found near Kitui.

Kirrika 34.

10. CUCUMIS *L.*

Trailers or climbers without a swollen rootstock, usually with stiff hairs, tripalmatifid leaves and simple tendrils; male and female flowers usually on the same plant, yellow; male flowers in sessile or pedunculate groups, with a campanulate receptacle-tube, united petals, 3 stamens (2 double 2-thecous, 1 single 1-thecous) arising from the middle of the tube with free filaments and anthers, the thecae folded 3 times (triplicate), and with a basal nectary free from the tube; female flowers solitary yellow, with an annular disc surrounding the style; fruit fleshy, indehiscent, ellipsoid or globose, not narrowed or pointed at either end, seeds smooth, horizontal.

1 Tendrils more than 1 at each node; fruit buried — 6. *C. humifructus*
  Tendrils solitary at each node; fruit not buried — 2
2 Fruit covered with fleshy, bristly-tipped projections — 3
  Fruit without projections, or with scattered hard spine-tipped projections — 4
3 Annual; leaves simple or obscurely lobed; fruit densely covered by fleshy projections — 5. *C. dipsaceus*
  Perennial; leaves always palmatifid with oblong lobes; fruit surface visible between projections — 4. *C. prophetarum*
4 Fruit without projections — 7. *C. hirsutus*
  Fruit with projections or spines — 5
5 Fruit projections less than 1·5 mm high; fruit stalk not thickened at insertion of fruit; fruit usually less than 5 cm long — 2. *C. ficifolius*
  Fruit projections more than 1·5 mm high; fruit stalk thickened at insertion of fruit; fruit more than 5 cm long when ripe — 6
6 Plant covered with thorn-like recurved hairs which are sharply distinct from rest of indumentum; fruit projections mamillate, ± flat-topped, with an apical spine — 3. *C. aculeatus*
  Plant without hooked hairs, or, if present, then these intergrading with rest of indumentum; fruit projections conical, without an apical spine — 1. *C. figarei*

2. Coccinia grandis (*L.*) *Voigt*

An almost glabrous perennial with a tuberous rootstock and perennial stems which become white-spotted with the development of cork even when quite young; the leaves are reniform, broader than long in outline, 3–5-lobed.

An uncommon plant found in dry *Commiphora* bushland. HM, MUM, KIS, MAG, NAN, NBI, KAJ.

Hanid and Kiniaruh 764; Kirrika 10.

3. Coccinia trilobata (*Cogn.*) *C. Jeffrey*

A perennial pubescent climber with a swollen fleshy rootstock and annual (occasionally perennial) stems; leaves reniform in outline and broader than long (from the top of the petiole), usually 5-lobed but sometimes simple.

A common plant around Nairobi in forest edges, and found in similar conditions east of, and in, the Rift Valley. HA, RV, NAN, MAC, NBI.

Agnew 8924; Kerfoot 1859.

4. Coccinia microphylla *Gilg*

Perennial climber with tuberous rootstock, perennial stems soon becoming white-spotted as cork forms; leaves reniform, broader than long in outline, palmatisect into seven lobes.

An uncommon plant found in dry bushland, particularly with *Combretum*. MAC, KAJ.

Verdcourt 3125.

4. DIPLOCYCLOS (*Endl.*) *von Post & O. Ktze.*

Perennial climber with bifid tendrils and characteristically shaped palmatifid leaves with broad-triangular spreading lower lobes; male and female flowers on the same plant; male flowers as in *Coccinia* except the stamens not fused in the centre; female flowers usually clustered, otherwise as in *Coccinia*; fruits usually clustered, subsessile, globose to ellipsoid, red with whitish stripes; seeds very bony, with a raised hemispherical disc and thick, 2-grooved margins.

1 Pedicels of male flowers 7–15 mm long; fruit subglobose, not beaked 1. *D. palmatus*
Pedicels of male flowers 17–30 mm long; fruit with a short conical beak 2. *D. schliebenii*

1. Diplocyclos palmatus (*L.*) *C. Jeffrey*

Perennial climber, glabrous except for sparse pubescence on nodes and young leaf bases; with leaves as in *D. schliebenii* but more deeply lobed.

Commoner than the next species, but local in medium altitude forest edges. HA, MUM, EMB, MAC, NBI.

Mainwaring 4857; Hanid and Kiniaruh 931.

2. Diplocyclos schliebenii (*Harms*) *C. Jeffrey*

Glabrous climber with annual stems and leaves with a 5-lobed lamina, the lobes ovate-triangular.

Uncommon plant found in the wettest forest zones. HA, HN.

Agnew 8737; Verdcourt and Polhill 2932.

5. LUFFA *Mill.*

Monoecious climbers with (usually) 3–6-fid tendrils and palmatifid, simple leaves; male flowers on a short raceme, with bracts small or absent, a short tube and free petals; stamens 5, all 1-thecous or by fusion apparently two double 2-thecous, 1 single 1-thecous, thecae much convoluted, the filaments free but anthers held together, exserted from the perianth; female flowers solitary with horizontal ovules; fruit smooth, ribbed or spiny, becoming dry and fibrous and dehiscing by an apical operculum; seeds compressed, smooth.

Luffa cylindrica (*L.*) *M. J. Roem.*

Annual or perennial herbaceous climber, sparsely hairy or glabrescent, with tendrils divided into 3–6 near the base, and with lobed leaves.

This is the cultivated 'loofah' which is used for scrubbing, and which is an apparent escape in the hotter parts of Kenya. MUM.

Agnew, Musumba, and Kiniaruh 8038.

6. PEPONIUM *Engl.*

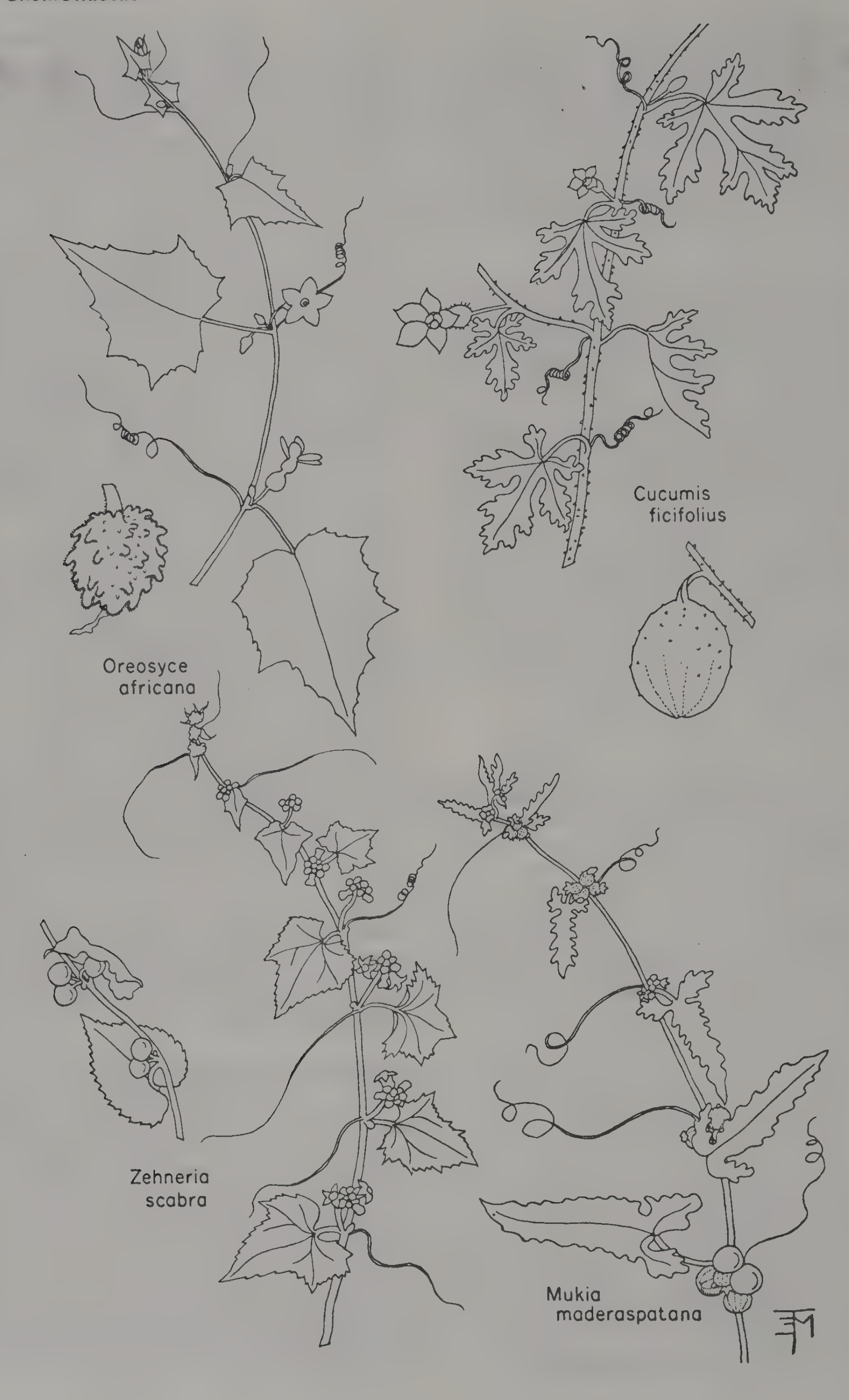
Medium sized dioecious herbs with (usually) bifid tendrils and scarious probracts present in the axils; leaves simple, palmatifid; male flowers solitary or more usually in bracteate racemes with an elongated receptacle tube, entire calyx, free petals, and with 3 stamens (all 2-thecous or two 2-thecous, one 1-thecous, thecae triplicate) with anthers united into a head included in the tube; female flowers solitary with horizontal ovules; fruit thin-walled, smooth, fleshy, indehiscent, reddish; seeds small, elliptic, compressed, not sculptured.

Peponium vogelii (*Hook. f.*) *Engl.*

A large or small climber or trailer, hispid-hairy to glabrous on all parts with the leaf lamina reniform-orbicular in outline, ± deeply 5–7-palmatifid.

A local plant of rocky places and forest edges with a very wide ecological tolerance. The dry land, rocky country form growing in the *Commiphora* bush area has narrowly acute-lobed leaves and is almost glabrous on the stems, while the form from wet upland forest edges has broad, obtuse leaf-lobes and densely hairy stems. HT, HL, HA, KIT, MUM, NAR, RV, MAC, NBI, KAJ.

Agnew and Hanid 8381; van Someren 159.


Cucumis
ficifolius
Oreosyce
africana
Zehneria
scabra
Mukia
maderaspatana

1. Cucumis figarei *Naud.* (see p. 179)

Perennial herb with spiny hairs and soft bristles and tripalmatifid suborbicular leaves.

Uncommon plant found in dry *Acacia* country. KIS, BAR, MAG.

Hanid and Kiniaruh 685; Lucas 221.

2. Cucumis ficifolius *A. Rich.* (see p. 176)

Perennial herb with spiny and soft spreading hairs, the leaves similar to *C. figarei* but usually deeply lobed.

An uncommon plant found in upland grassland and pathsides, usually 5000–8000 ft in our area. HC, HT, HM, HA, NAR, RV, NBI.

Parsons in EAH 13696.

3. Cucumis aculeatus *Cogn.*

Perennial herb with spiny yellow-hooked hairs on stem ridges and major veins of lower leaf surface, these hairs differing sharply from the spreading indumentum of the leaves; leaves ovate, hardly suborbicular, deeply to shallowly lobed.

A common plant of grassland and bushland, 4000–6000 ft. HL, HA, NAR, RV, MAC, NBI, KAJ.

Strid 2048; Napier 739.

4. Cucumis prophetarum *L.*

Perennial herb with scabrid, but not spiny, hairs and deeply 3–5-palmatisect leaves.

A common species of the bushland and lower grassland of our area, particularly in *Combretum* and *Commiphora* country. BAR, MAG, EMB, MAC, KAJ.

Hanid 538; Verdcourt 3279.

5. Cucumis dipsaceus *Spach*

Annual herb with stiff, almost prickly, spreading hairs; leaves suborbicular-reniform in outline, hardly lobed.

A common species of dry bushland. BAR, MAG, EMB. MAC, KAJ.

Lind 5720; Glover 2823.

6. Cucumis humifructus *Stent*

Annual herb with soft spreading hairs and several weak tendrils in each axil, the leaves reniform, hardly lobed; fruit smooth, becoming buried in soil when ripe.

A rare but probably overlooked plant which turns up occasionally as a weed of cultivation at medium altitudes. RV, MAC, NBI.

Sydserff September 1940; Rishbeth October 1967.

7. Cucumis hirsutus *Sond.*

Perennial with a woody rootstock and coarse spreading hairs, the leaves ovate to lanceolate, hardly lobed.

A rare plant found in dry bushland recorded only from MAC.

No specimens seen.

11. OREOSYCE *Hook. f.*

Differing from *Cucumis* only in the straight or hooked anther thecae and in the fruit which is lobed and bristly-hairy.

Oreosyce africana *Hook. f.* (see p. 176)

Perennial climber with annual stems, all parts except leaves with brown bristly ± glossy hairs, the leaves pentagonal or shallowly lobed.

Common in the colder highland forests. HE, HM, HA, HK, KAJ.

Agnew and Kiniaruh 8893; Lucas 224.

12. CUCUMELLA *Chiov.*

Similar to *Cucumis*, differing only in the straight or apically hooked anther thecae and the fruit which is smooth, thin-skinned (so that when dry the seeds show through), and often tapered.

Cucumella engleri (*Gilg*) *C. Jeffrey*

Perennial herb with densely tomentose scabrid indumentum; leaves reniform or pentagonal.

Uncommon plant found in dry country. It was first collected at Nakuru over 50 years ago but has not been found there since. KIT, NAR, RV.

Glover 1736.

13. MUKIA *Arn.*

Perennial climbers with the aspect of *Zehneria* and similar to that genus except for the sessile flowers, the stamens 3 with two 2-thecous and one 1-thecous, and the densely hairy ovary.

Mukia maderaspatana (*L.*) *M. J. Roem.* (see p. 176)

Monoecious, hispid-hairy perennial climber with a woody rootstock and woolly growing apices; leaves with a ± hastate lamina.

A locally common plant along the shore of Lake Victoria in the west of our area, and also found on the Kenya coast, MUM, KIS.

Hanid and Kiniaruh 694.

14. ZEHNERIA *Endl.*

Climber similar to *Cucumis* except for the much smaller, often tubular flowers with the stamens all 2-thecous, the thecae arcuate or straight, the frequently clustered female flowers, and the usually

3. Kedrostis foetidissima (*Jacq.*) *Cogn.*

Rarely glabrous, usually densely glandular-hairy, evil-smelling perennial climber with simple tendrils and orbicular, cordate leaves.

An uncommon plant found in dry *Commiphora* bushland country. MUM, MAC, NBI. KAJ.

Kokwaro 142; Harmsen 6468.

4. Kedrostis hirtella (*Naud.*) *Cogn.*

Perennial, strigose spreading-hairy climber with bifid tendrils and palmatifid leaves, orbicular-reniform in outline.

A common plant in the *Combretum* and general bush country of Machakos district but rather rare elsewhere. RV, NAN, MAC, KAJ.

Agnew 7627; van Someren 524.

17. CORALLOCARPUS *Hook. f.*

Climbing herbs very similar to *Kedrostis* but with the male flowers in short-racemose or ± capitate, ebracteate heads, without produced connectives in the stamens, and with the fruit dehiscent, the apical portion separating from the cup-like base in a pyxidate manner to expose the red seed-mass.

In general a genus in which much more collecting is required in Kenya, especially of fruits with the same species' male flowers.

1 Fruit conspicuously hairy; stems spreading, crisped-hairy — 2. *C. boehmii*
  Fruit glabrous or only minutely hairy; stems ± glabrous — 2
2 Fruit beak over 2 mm long; stems ± glabrous — 1. *C. epigeus*
  Fruit beak under 2 mm long; stem minutely hairy — 3. *C. schimperi*

1. Corallocarpus epigeus (*Rottl.*) *C. B. Cl.*

Climbing, monoecious herb with ± glabrous glaucous stems and palmatifid leaves.

An uncommon plant found in *Commiphora* bushland. The male inflorescences are difficult to identify and a search should also be made for female flowers and fruits, the latter being most characteristic. A form with spherical, clustered fruits and short (3 mm) ornamented seeds occurs east of our area and may turn out to be another species. It should be looked for in Tsavo, east and west. RV, MAC.

Polhill in EAH 12009.

2. Corallocarpus boehmii (*Cogn.*) *C. Jeffrey*

A crisped-pubescent monoecious perennial similar to *C. epigeus.*

A rare plant found so far in *Combretum* savannah. MAC.

van Someren 105.

3. Corallocarpus schimperi (*Naud.*) *Hook. f.*

Similar to *C. epigeus* except for the short pubescence of the stem and leaves.

Recorded once from our area at Isiolo in FTEA. No specimens seen.

18. GERRARDANTHUS *Hook. f*

Dioecious climber with woody perennial stems and tendrils bifid towards the apex; leaves simple; flowers regular to zygomorphic; male flowers in few- to many-flowered panicles with 5 unequal petals, and 5 stamens, all 1-thecous in 2 pairs and one alone, the latter often sterile, the thecae straight; female flowers in few-flowered panicles, with a similar perianth to the male flowers; fruit a capsule, pendulous, dry, flask-shaped, opening by a triradiate apical slit to liberate the pendulous winged seeds.

Gerrardanthus lobatus (*Cogn.*) *C. Jeffrey*

Perennial climber with swollen succulent rootstock and ± fleshy, minutely pubescent stems, otherwise ± glabrous, with leaves orbicular or reniform.

A common plant in certain areas of *Commiphora* bushland and dry rocky places. NAR, RV, MAG, MAC, KAJ.

Thorold in EAH 17367.

44. BEGONIACEAE†

Mostly succulent herbs or soft shrubs, rarely climbers, with alternate simple or compound, often asymmetric stipulate leaves; flowers unisexual, regular; male flower with 2 sepals, 0–5 petals and numerous stamens with 2-loculate anthers; female flower similar but without stamens and with inferior 2–4- (usually 3-) locular ovary with axile placentation; stigmas 3, often twisted and divided; fruit a capsule or berry; seeds very numerous, minute, without endosperm.

1. BEGONIA *L.*

Succulent or subsucculent herbs or climbers with asymmetric leaves, with the characters of the family but with only 2 or fewer petals; fruit a berry or loculicidal capsule.

1 Fruits winged — 2
  Fruits without wings — 3
2 Leaf teeth acutely or obtusely angled; flowers over 3 cm diameter — 4. *B. keniensis*
  Leaf teeth rounded; flowers under 3 cm diameter — 5. *B. johnstonii*
3 Leaves lobed; plant erect — 3. *B. oxyloba*
  Leaves unlobed; plant trailing or hanging — 4

† By A. D. Q. Agnew.

glabrous, smooth red fruit with a thin or leathery pericarp.

1 Stems and leaves glabrous 1. *Z.* sp. *A*
  Stems and/or leaves pubescent (sparsely in *Z. oligosperma*) 2
2 Leaves densely pubescent to tomentose below so that the lower side is lighter in colour than the upper 2. *Z. scabra*
  Leaves the same colour on both sides, or if lighter beneath then this not due to hairiness 3
3 Leaves scabrid-hairy beneath (and usually above) 4. *Z. minutiflora*
  Leaves almost glabrous except on the nerves below 3. *Z. oligosperma*

1. Zehneria *sp.* **A.**

Climber with glabrous stems and ovate leaves.

This plant has only been found once at Kinangop in bamboo forest. It is described as above in the FTEA by Jeffrey.

2. Zehneria scabra (*Linn. f.*) *Sond.* (see p. 176)

A dioecious pubescent perennial climber with stems becoming thick, white and jointed, and with ovate, often shallowly lobed, cordate leaves.

Probably our commonest Cucurbit, growing in forest edges and abandoned cultivation and bushland up to 10 000 ft, and often the only Cucurbit present in large areas of bamboo and secondary forest. HE, HC, HT, HM, HL, HA, HK, HN, KIT, MUM, KIS, NAR, RV, EMB, MAC, NBI, KAJ.

Strid 2815; Verdcourt 978.

3. Zehneria oligosperma *C. Jeffrey*

Dioecious, almost glabrous climber with annual stems and simple tendrils, drying light green, the leaves ovate cordate in outline, often simple, sometime palmatifid.

A rare plant of *Combretum* shrubland. MAC, KAJ.

Bally 1173; Agnew, Hanid, and Kiniaruh 9260.

4. Zehneria minutiflora (*Cogn.*) *C. Jeffrey*

Dioecious scabrid pubescent climber with herbaceous, often glabrous stems, and leaves ovate-pentagonal in outline, very scabrid.

An uncommon plant found in wet upland forest edges and swamps, 4000–10 000 ft. HC, HM, HA, KIT.

Hudson in EAH 13370; Agnew 8989.

15. MYRMECOSICYOS *C. Jeffrey*

Monoecious herbs with palmatisect leaves and no tendrils; male flowers few, axillary, fascicled, with short obscure tube and rounded free petals; stamens 3, 2 double 2-thecous, 1 single 1-thecous, with lightly coherent anthers and arcuate, apically incurved thecae; female flowers sometimes co-axillary with males, with horizontal ovules; fruit small, fleshy; seeds ovoid, smooth.

Myrmecosicyos messorius *C. Jeffrey*

A prostrate herb from a woody rootstock, scabrid-hairy to pubescent on all parts, with the leaves deeply palmatisect into linear, fleshy lobes.

A rare endemic, recently described, apparently dependent upon harvester ants in dry country for its survival, for it has been found only on the bare ground around their nests. RV, KAJ.

Verdcourt and Polhill 4005.

16. KEDROSTIS *Medik.*

Shrubby or herbaceous climbers with simple or divided, entire or lobed leaves, and usually simple tendrils; flowers small, often greenish-yellow; male flowers usually in pedunculate racemes, with a campanulate receptacle tube and united petals; stamens 5, all 1-thecous, two pairs close together and 1 alone, the thecae straight or only slightly curved; disc basal, not distinct from tube and not surrounding base of style; female flowers usually solitary, with staminodes and a 2-lobed stigma; fruit usually solitary, fleshy, usually beaked, dehiscent or indehiscent; seeds horizontal, often ± globose, smooth.

1 Plant a woody climber with grooved, hard, stony, easily cracking bark 2
  Plant herbaceous, bark green, not stony nor easily cracking 3
2 Leaves palmate with 3 leaflets 2. *K. pseudogijef*
  Leaves palmatifid with 3 lobes 1. *K. gijef*
3 Leaves simple, unlobed; fruit globose, less than 1·5 cm long 3. *K. foetidissima*
  Leaves palmatifid; fruit cylindrical, more than 4 cm long 4. *K. hirtella*

1. Kedrostis gijef (*J. F. Gmel.*) *C. Jeffrey*

Woody climber with simple tendrils, roughly hairy, with stems soon becoming white- or pale-corky, smooth and ridged, and with palmatifid leaves.

A fairly common plant of dry *Commiphora* bushland in the west of our area. MAG, KAJ.

Harmsen 6485; Glover 3462.

2. Kedrostis pseudogijef (*Gilg*) *C. Jeffrey*

Similar to *K. gijef* except for the rough brown stems, trifoliolate leaves and much smaller flowers (to 2·25 mm long, half the size of those of *K. gijef*).

There is one record of this species within our area, from near the Chyulu hills. KAJ.

Agnew 9803.

4 Leaves ± symmetrical at base; flowers usually more than five together in cymose inflorescences — 1. *B. meyeri-johannis*
Leaves very asymmetric at base; flowers 1-3 together, axillary — 2. *B. eminii*

1. Begonia meyeri-johannis *Engl.*

A dioecious woody forest climber, glabrous except for the lower leaf veins and petioles, with simple ovate to suborbicular acuminate asymmetric leaves; flowers in loose axillary cymes, white, tinged pink; fruits hard and woody.

A common plant in the wettest highland forest, 5000-8000 ft. HM, HA, HK, HN.

Agnew 5845; Brunt 60/393.

2. Begonia eminii *Warb.*

A trailing epiphyte with woody stems and lanceolate-elliptic leaves; flowers white; fruits soft, papery.

In Kakamega forest only. MUM.

Dale 3250.

3. Begonia oxyloba *Hook. f.*

A soft watery erect herb with 5-7-lobed, orbicular leaves and axillary clusters of white and pink flowers; fruits with a papery wall.

In Kakamega forest only. MUM.

Record from Faden *in litt.*

4. Begonia keniensis *Engl.* (see p. 179)

An erect tuberous-rooted herb to 1·5 m with glabrous fleshy stems and suborbicular asymmetric, serrate leaves; flowers 1-3 at the nodes, large, all pinkish-white.

A rather rare plant of highland waterfalls where it is continually wetted by spray. It is found in the wet highland forest area and also at the Chania Falls, Thika. HE, HK, MAC.

Agnew 7727; Battiscombe 136.

5. Begonia johnstonii *Oliv.*

Similar to *B. keniensis* but smaller throughout.

Rare plant found in wet riversides. NAR.

Bally 8038.

45. CACTACEAE†

Usually fleshy xerophytes with reduced leaves and stems modified for water storage, usually spiny; leaves entire, often modified to spines, exstipulate; flowers usually solitary or in racemes or spikes, bisexual, regular or zygomorphic; perianth usually at apex of a receptacle-tube, usually of numerous free parts showing a transition from green to petaloid; stamens numerous; ovary inferior, of 2 to many carpels with parietal placentation, the ovules on long, often branched funicles; style simple; fruit a berry; seeds without endosperm.

1 Epiphyte; stem unarmed — 1. *Rhipsalis baccifera*
Herb or shrub; stem spiny, flattened — 2. *Opuntia vulgaris*

1. RHIPSALIS *Gaert.*

Pendulous or erect epiphytes with cylindrical, fleshy stems, tiny leaves and no spines; flowers in terminal spikes; outer perianth segments very short, usually 3; inner perianth segments 6-10, oblong; stamens about 20; ovary glabrous; stigma 4-lobed; fruit a small translucent berry.

Rhipsalis baccifera (*J. Mill.*) *Stearn*

A glabrous hanging epiphyte with narrow (to 6 mm diameter) stems and sessile pink flowers in terminal spikes.

Rather a local epiphyte, but one which could turn up anywhere in the upland forest area. HM, HA, HK, KIS, NAR, NBI, KAJ.

Agnew 7798.

2. OPUNTIA *L.*

Fleshy succulents with terete, cylindrical or flattened, spiny stems, without deep grooves and ridges; leaves present, soon falling, linear to triangular; flowers with spiny ovary, many yellow perianth segments and slightly zygomorphic stamens; fruit a pear-shaped berry.

Opuntia vulgaris *L.*

Succulent shrub to 2·5 m, with flattened, jointed stems, glabrous except for the tuft of hairs at the base of each group of spines; flowers to 10 cm long, yellow.

Introduced from Central America and occasionally escaped in dry ranching land. MAC.

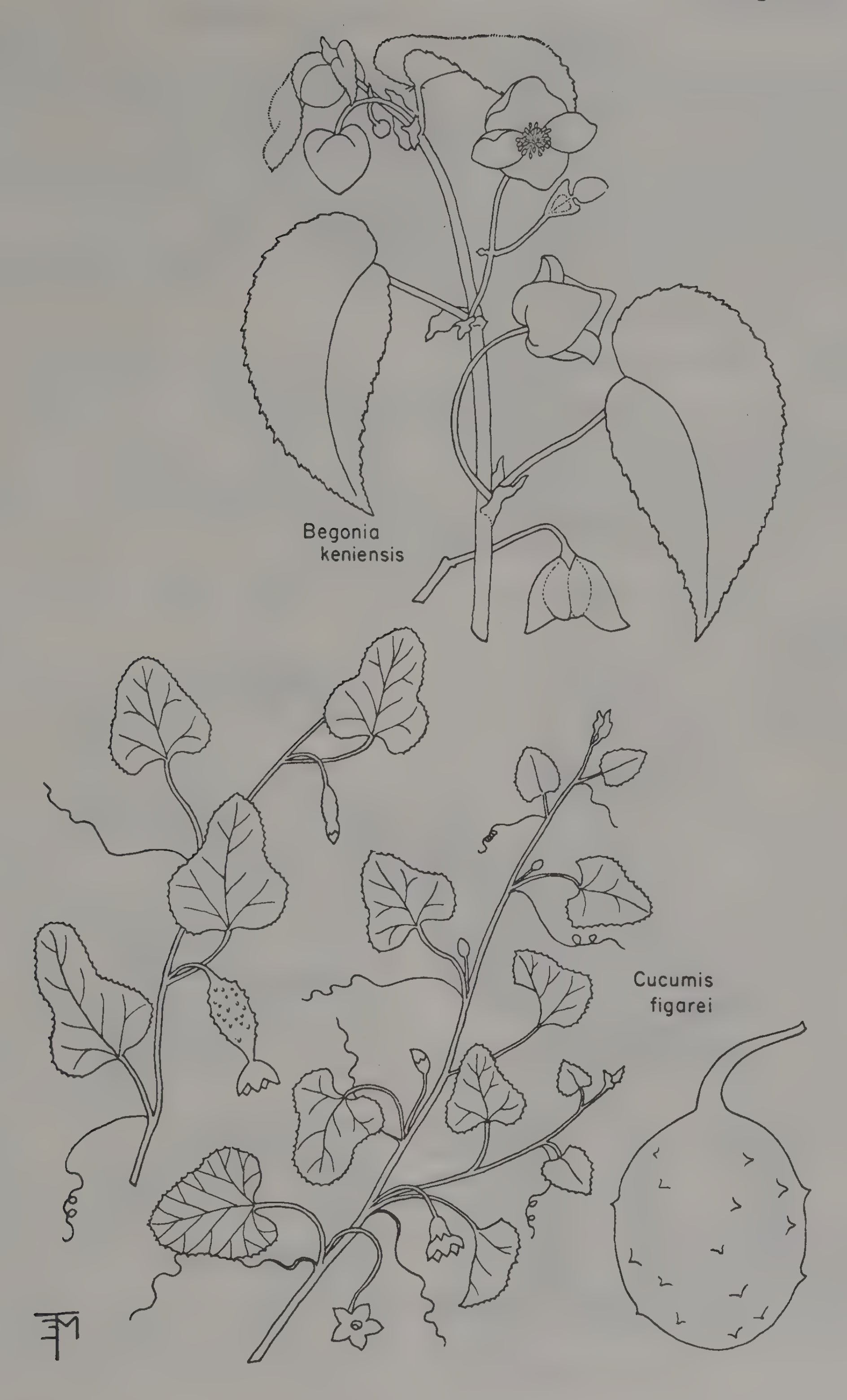
Verdcourt 2623.

46. MELASTOMATACEAE‡

Trees, shrubs, or herbs with opposite simple exstipulate leaves usually with 3-7 parallel nerves; inflorescence cymose or paniculate or flowers solitary; flowers usually regular, sometimes zygomorphic, with a receptacular tube at base which may be partially fused to the ovary; sepals and petals 4-5 from the top of the receptacle tube, free; petals contort; stamens usually twice petal number, with 2-celled, usually porose anthers, and characteristic kneed or tubercled filaments; ovary superior, often 5-celled, with axile placentation and small seeds, rarely 1-celled; style and stigma 1,

† By A. D. Q. Agnew.

‡ By A. D. Q. Agnew.


Begonia
keniensis
Cucumis
figarei


Dissotis canescens
Dissotis speciosa
Dissotis senegambiensis

the latter capitate; fruit usually a dry capsule, rarely fleshy.

1 Flowers in a capitulum enclosed by woody persistent bracts
3. *Tristemma incompletum*
Flowers not sessile in a capitulum, not enclosed in woody persistent bracts 2
2 Annual plants; stamens all similar
1. *Antherotoma naudinii*
Perennials or annuals; stamens in 2 series, 4–5 large alternating with 4–5 small
2. *Dissotis*

1. ANTHEROTOMA *Hook. f.*

Herbs with square stems and leaves with 3–5 parallel nerves; flowers in condensed terminal dichasia; receptacle tube broadly fused to ovary to half-way or more; sepals 4–5, persistent; petals 4–5, pink to purple; stamens 8–10, all similar, all with 2 small lobes at the knee; ovary with a ring of bristles at tip; fruit and seeds as in *Dissotis*.

Antherotoma naudinii *Hook. f.* (see p. 189)

Annual herb with stiff, bristly, white hairs and ovate to lanceolate leaves; cymes almost sessile, of pink flowers.

A common plant of western Kenya, particularly the northern part of our area on shallow soils. HC, HM, KIT, MUM, KIS.

Agnew and Musumba 8568.

2. DISSOTIS *Benth.*

Herbs, shrubs, or rarely trees with square stems and leaves with 3–5 parallel nerves; inflorescences dichasially cymose or flowers solitary; receptacle tube cylindrical, simple- or stellate-hairy; sepals 4–5, deciduous or persistent; petals 4–5, usually blue to purple; stamens 8 or 10, all equal or 5 with long and 5 with short knees or with differently shaped knees on the filament, often all held in one plane so that the flower appears zygomorphic; receptacle tube fused to the ovary at base by 5 septa; ovary with 4–5 loculi, bristly-hairy above; fruit a censer capsule opening apically; seeds small, reniform in outline, smooth.

1 Flowers solitary; receptacle tube over 8 mm long 1. *D. speciosa*
Flowers numerous in variously arranged inflorescences; receptacle tube under 8 mm long 2
2 Inflorescence subcapitate; flowers 4-merous and overtopped by the subtending leaves
2. *D. debilis*
Inflorescence elongate, the flowers mostly 5-merous, not overtopped by the subtending leaves or if so then flowers at different levels, not in a globular or flat-topped head 3
3 Leaves parallel-sided, white-canescent on the lower side; receptacle-tube very shortly stellate-hairy; sepals persistent in fruit
3. *D. canescens*
Leaves ovate to lanceolate, not parallel-sided, hairy but not canescent on the lower side; receptacle-tube with simple hairs or conspicuously stellate-bristly, the bristles on lobes and protuberances; sepals deciduous in fruit 4
4 Stem with long spreading bristles
4. *D. senegambiensis*
Stem ± adpressed pubescent 5. *D. brazzae*

1. **Dissotis speciosa** *Taub.* (see p. 182)

A sericeous erect shrub with lanceolate subsessile leaves and solitary vivid blue-purple flowers.

A local plant of streamsides and marshes in west Kenya only. HE, KIT, MUM, KIS, NAR.

Tweedie, January 1966; Glover 2296.

2. **Dissotis debilis** (*Sond.*) *Triana*

An erect annual with adpressed or ascending hairs and lanceolate (to rarely ovate) leaves; inflorescence sub-capitate with 4 sessile cymes in the 2 upper pairs of leaves; flowers blue-purple.

A rare plant of grassland, where it has been found under medium to dry conditions at the coast and in KIT.

Brodhurst-Hill 367.

3. **Dissotis canescens** (*Graham*) *Hook. f.* (*D. incana* Triana) (see p. 182)

A pubescent perennial from a woody rootstock, with oblong-linear leaves; inflorescence a panicle of pedunculate cymes of sub-sessile purple flowers.

A common plant of burnt grassland in the Kitale region. HE, HC, HT, KIT, KIS.

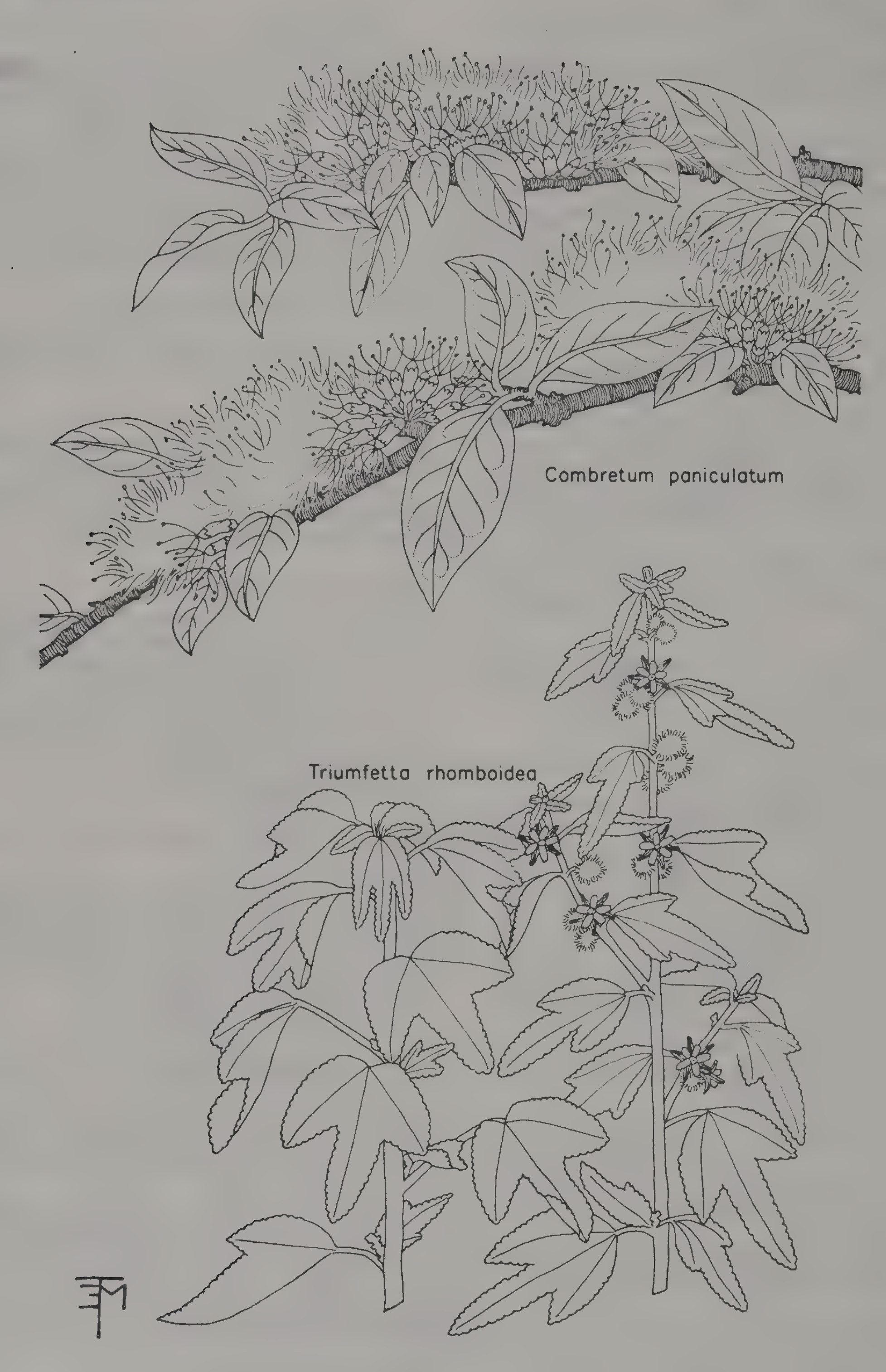
Tweedie, January 1966; Symes 6200.

4. **Dissotis senegambiensis** (*Guill. & Perr.*) *Triana* (see p. 182)

An erect bristly annual or perennial herb with lanceolate to linear or even ovate leaves, cymes almost sessile to pedunculate at apices with shortly pedicellate purple flowers.

Our commonest *Dissotis*, turning up all over our area at medium altitudes (4000–8000 ft) usually on pathsides and in disturbed grasslands on basement complex rocks. It is also found by the hot springs and steam jets in the Rift Valley. HC, HT, HM, HA, HK, KIT, MUM, KIS, NAR, RV, EMB, MAC.

Strid 2822; Napier 10850.


Combretum paniculatum
Triumfetta rhomboidea

5. **Dissotis brazzae** *Cogn.*

An erect pubescent perennial herb with broad ovate-elliptic leaves; inflorescence a paniculate raceme of pedunculate cymes with subsessile purple flowers.

Common in waste ground, forest edges, and grassland near Kakamega and towards Kitale. KIT, MUM.

Strid 3380; Webster 8750.

3. TRISTEMMA *Juss.*

Shrubs or herbs with vegetative and floral characteristics of *Dissotis* except for the inflorescence which is a capitulum of sessile flowers surrounded by 2 pairs of persistent hard woody bracts, the stamens which are all similar with the tuberculae at the 'knee' very close to the anther, and the ovary which adheres broadly (not by 5 septa) to the receptacle tube and which is not 5-valved but bursts irregularly in fruit.

Tristemma incompletum *R. Br.*

An erect stiff-haired short-lived soft shrub or herb with broad-elliptic leaves and subsessile heads of pink flowers.

An uncommon plant found in low-lying swamps in west Kenya. MUM.

Graham 62; Agnew and Musumba 8601.

47. COMBRETACEAE†

Trees, shrubs, or climbers with opposite simple exstipulate leaves; flowers in racemes, bisexual; receptacle often forming a tube; sepals 4–8, valvate; petals 0–5, small; stamens 4–10, in two series; ovary inferior, 1-locular, with a simple style and 2–6 pendulous ovules from the apex of the loculus; fruit often 1-seeded, winged, rarely dehiscent; seeds without endosperm.

A large family of tropical trees and shrubs which are dealt with in KTS. The only species remaining for us to consider are the climbers in the genus *Combretum*. Some of these occasionally grow as shrubs and so are described in KTS. Here therefore all climbing and scrambling species are keyed out but only those which do not appear in KTS are described.

1. COMBRETUM *Loefl.*

Shrubs, trees, or climbers with usually hairy leaves; flowers 4–5-merous, with or without a well-developed receptacle-tube which is often constricted above the basal nectary; stamens 8–10, in two whorls; ovary 1-celled with 2–6 ovules; fruit indehiscent, usually 4–5-winged but sometimes merely angled.

Key to Upland Kenya climbers only:

1 Plant climbing by means of hooked, thorny, persistent petioles; flowers 5-merous; fruits 5-winged — 2
  Plant twining, without hooks; flowers 4-merous; fruits 4-winged — 3
2 Racemes with a few leaves at base bearing axillary flowers; fruit to 18 mm long — 1. *C. aculeatum*
  Racemes without bracts or leaves, usually on leafless shoots; fruit over 20 mm long — 2. *C. mossambicense*
3 Flowers with red petals and stamens protruding out of a receptacle-tube at least 5 mm long; fruits 2–3 cm long — 3. *C. paniculatum*
  Flowers yellow-white, without a tube; fruits less than 1·7 cm long — 4. *C. padoides*

1. **Combretum aculeatum** *Vent.*

Described in KTS p. 141. BAR, EMB, MAC, KAJ.

2. **Combretum mossambicense** (*Klotzsch*) *Engl.*

A pubescent shrub or loose climber with ovate-elliptic rounded leaves and racemes of crowded green, cream-pink or even crimson flowers.

A plant of *Commiphora* bushland, especially along water courses. KAJ.

Bally 1053.

3. **Combretum paniculatum** *Vent* (see p. 184)

A twining, woody climber with opposite leaves and glabrous or pubescent stems; racemes borne in axillary panicles on pendulous, non-twining branches; flowers red and very showy.

A local but most impressive plant, usually growing in riverine forest at lower altitudes but not at the Coast. HA, MUM, EMB, MAC, KAJ.

Agnew and Hanid 7526; Dale 3197.

4. **Combretum padoides** *Engl. & Diels*

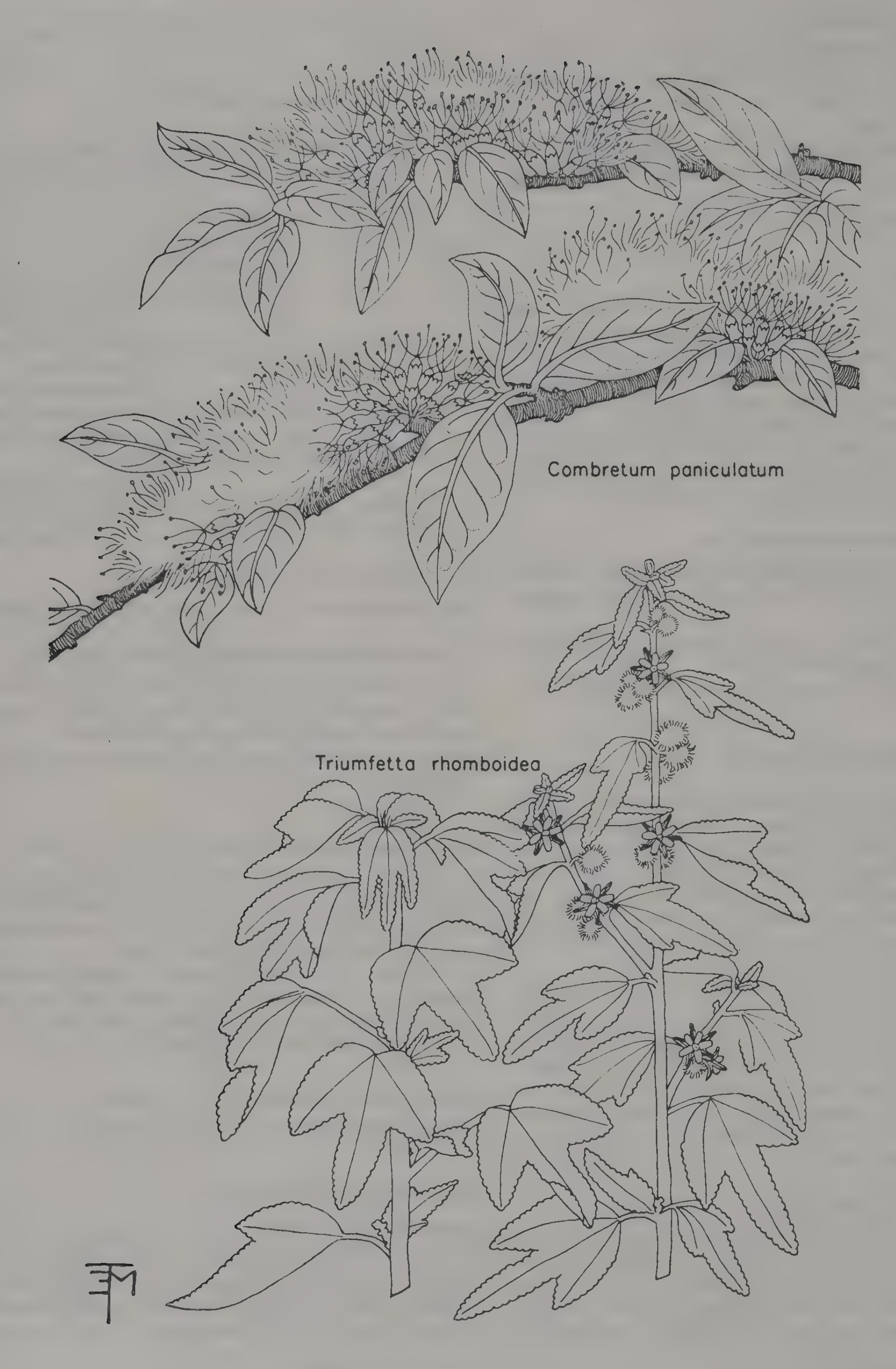
Described in KTS p. 146. KAJ (Loitokitok).

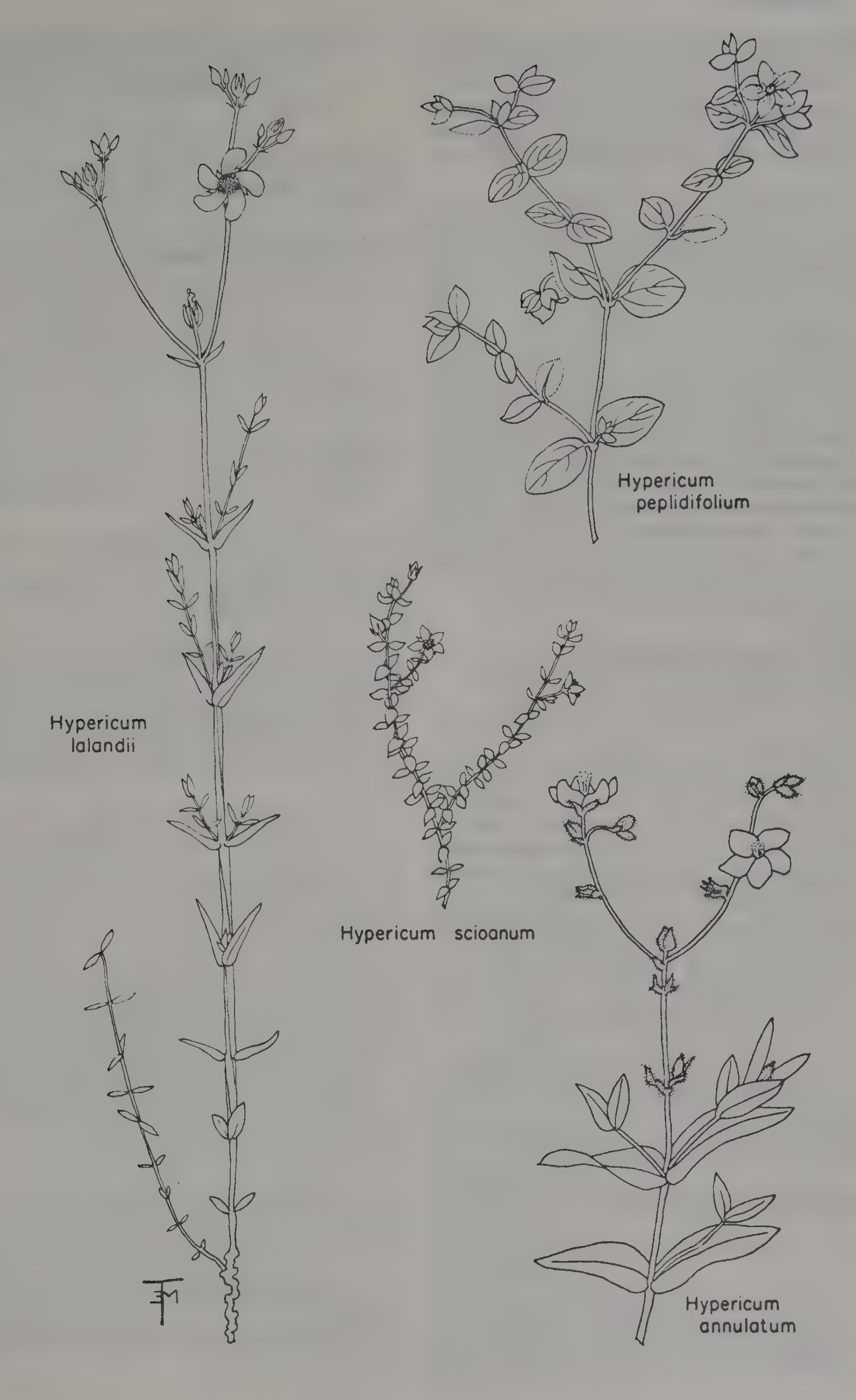
48. HYPERICACEAE‡

Herbs, shrubs, or trees with opposite or rarely alternate simple exstipulate leaves, often gland-dotted; inflorescence cymose or flowers solitary; flowers regular, bisexual; sepals 5, often glandular, free, without a tube at base; petals 5, free; stamens

† By A. D. Q. Agnew.

‡ By A. D. Q. Agnew.


Combretum paniculatum
Triumfetta rhomboidea



Hypericum peplidifolium
Hypericum lalandii
Hypericum scioanum
Hypericum annulatum

numerous, indefinite, often united into bundles opposite the sepals; anthers with 4 pollen sacs; ovary usually of 5 carpels, fused at base, with 5 free styles and stigmas; ovules and seeds usually numerous, sometimes solitary in each carpel; fruit a berry, capsule or drupe; seeds with little endosperm.

A family with 5 genera of trees found in Kenya which can be identified through KTS. One of the genera, *Hypericum*, includes a number of herbs which are treated here.

1. HYPERICUM *L.*

Trees, shrubs, or woody herbs with opposite, usually sessile, gland-dotted, entire leaves; flowers terminal, solitary or in dichasial cymes, often corymbose; sepals 5, often gland-dotted; petals 5, often asymmetric, yellow, often with black glands, persistent after flowering; stamens numerous, arranged in groups or the filaments fused into a ring around the ovary; styles 3-5; fruit usually a septicidal capsule, rarely an indehiscent berry; seeds minute, cylindrical.

1 Trees or shrubs — 2
 Herbs — 6
2 Flowers in corymbose cymes — 3
 Flowers solitary — 5
3 Leaves rounded at apex; styles 3 (-4) — 1. *H. kiboense*
 Leaves acute at apex; styles 5 — 4
4 Leaves with conspicuous reticulate venation visible on underside — 2. *H. roeperianum*
 Leaves without reticulate venation visible on underside — 3. *H. quartinianum*
5 Leaves up to 3-7 cm long with pinnate venation, the pinnate veins numerous — 4. *H. revolutum*
 Leaves up to 6 cm long, with most veins parallel to the midrib except for 2-4 pinnate in the upper half — 5. *H. keniense*
6 Inflorescences many-flowered; styles 3-4 — 7
 Flowers solitary, often axillary; styles 4-5 — 10
7 Leaves pubescent; calyx with stalked glands — 8
 Leaves glabrous; calyx with sessile glands or none — 9
8 Flowers ± capitate — 6. *H. afromontanum*
 Flowers in a loose paniculate cyme — 7. *H. annulatum*
9 Leaves erect; sepals without marginal glands — 8. *H. lalandii*
 Leaves spreading; sepals with black marginal glands — 9. *H. conjunctum*
10 Leaves with secondary nerves ± parallel, joining midrib at base; without black glands on leaf or sepal edges; fruit a capsule — 10. *H. scioanum*
 Leaves with pinnate secondary venation, joining midrib above the base; often with black glands on leaf and sepal edges; fruit fleshy — 11. *H. peplidifolium*

1. Hypericum kiboense *Oliv.*

A small shrub to 3 m, described in KTS p. 235. HE, HA, HK.

2. Hypericum roeperianum *A. Rich.*

A shrub or small tree to 5 m, described in KTS p. 237. HM, HA, HK, NAR, NAN, MAC, NBI.

3. Hypericum quartinianum *A. Rich.*

A shrub to 5 m, described in KTS p. 237. HC, HE, HM, KIT.

4. Hypericum revolutum *Vahl* (*H. lanceolatum* Lam.)

A shrub or medium tree to 13 m, described in KTS p. 235. HE, HA, HK.

5. Hypericum keniense *Schweinf.*

A shrub or medium tree to 13 m, described in KTS p. 235. HE, HA, HK.

6. Hypericum afromontanum *Bullock*

Perennial pubescent to glabrescent herb with oblong-elliptic to lanceolate leaves; flowers few in a dense head supported by bracts with marginal stalked black glands forming a ring round the stem at their base; petals yellow with black glandular dots.

A rare endemic of Mt. Elgon and Mt. Kenya growing above 9000 ft in grassland. This may turn out to be merely a form of the next species, *H. annulatum*, when more material has been collected.

Gardner 2259.

7. Hypericum annulatum *Moris* (see p. 185)

A minutely pubescent perennial herb with ovate to lanceolate leaves and flowers in lax corymbs with very much reduced glandular-hairy bracts.

Locally common on sandy grassland, 3500-8000 ft. HT, HM, HA, HK, BAR, KIT, RV, NAN, MAC.

Tweedie 67/104; Glover 4217.

8. Hypericum lalandii *Choisy* (see p. 185)

A glabrous perennial herb with erect stems to 60 cm; leaves to 2 cm long, lanceolate-elliptic, often almost linear and few-leaved on the flowering stems; inflorescence a ± elongated cyme; bracts eglandular; sepals 5-7 mm long, ovate to lanceolate, glandular; petals to 10 mm long, yellow, without black dots.

Locally common in the Kitale district in seasonally flooded grassland. HC, HA, KIT.
Tweedie 66/79; Symes 615.

9. Hypericum conjunctum *N. Robson*

Probably perennial, possibly weakly scrambling glabrous herb with elliptic undulate leaves and paniculately cymose flowers.

A rare species only collected once from the Narok area, and one which should be searched for. NAR.
Rammell 3492.

10. Hypericum scioanum *Chiov.* (see p. 185)

Glabrous perennial trailing herb with suborbicular to ovate-elliptic leaves and solitary flowers; fruit a dry capsule.

An uncommon plant of montane grassland by streams, 6500–10 000 ft. HE, HT, HM, HA, KIT.
Agnew 9025; Napier 705.

11. Hypericum peplidifolium *A. Rich.* (see p. 185)

A glabrous creeping herb very similar to *H. scioanum* except for the larger leaves with the lateral nerves joining the midrib above the base and the fruit a conical berry.

A common plant of alpine and subalpine grassland and stream edges, also found down to 4000 ft in suitably wet places with short grass. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, RV, KAJ.
Hanid 230; Kerfoot 3991.

49. TILIACEAE†

Small trees or shrubs, rarely herbs, often with stellate hairs; leaves usually alternate, simple or rarely digitate, entire, toothed or lobed; stipules paired, usually small and deciduous; inflorescence usually a cyme, often leaf-opposed, sometimes a corymb or panicles, usually axillary, sometimes terminal; flowers regular, mostly bisexual; sepals 5, rarely 2–4, valvate; petals as many as sepals, alternate with them, rarely absent, often with a gland or appendage at base; stamens usually many, often on a distinct androgynophore, free or connate at base, all fertile or the outer sterile; ovary superior, 2–10-celled, with 1 to many axile ovules per cell; fruit a dry or fleshy drupe or schizocarp, 2–10-celled or 1-celled by abortion, sometimes transversely septate between seeds; seeds endospermous, with straight embryo.

1 Leaves with a pair of setaceous basal appendages — 1. *Corchorus*
  Leaves without a pair of basal appendages — 2
2 Flowers white to purple-pink; some stamens sterile, without anthers; pedicels articulated above the middle — 2. *Sparrmannia ricinocarpa*
  Flowers yellow; all stamens fertile; pedicels not articulated — 3. *Triumfetta*

† By M. A. Hanid.

1. CORCHORUS *L.*

Herbs or small shrubs with simple or stellate hairs; leaves alternate, serrate or deeply lobed, with a pair of setaceous basal-appendages (in ours); stipules lateral; inflorescences usually axillary or leaf-opposed bracteate pedunculate cymes; flowers small, yellow; sepals 4–5; petals 4–5, as long as sepals, usually with a short basal claw; stamens 7 to many; ovary 2–5-celled, borne on a short androgynophore; stigma mostly cup-shaped; fruit an elongated or subglobose capsule, smooth or prickly, loculicidally 2–5-valved, sometimes transversely septate within, 2- to many-seeded; seeds pendulous or horizontal, usually with curved embryo.

1 Capsule elongate, without any prickles — 2
  Capsule globose, covered with prickles — 1. *C. hochstetteri*
2 Capsule terminated by a simple erect beak — 3
  Capsule with 3 spreading horns at the apex — 2. *C. tridens*
3 Capsule 5-valved, beak about 12 mm long — 3. *C. olitorius*
  Capsule 3–4-valved, beak much shorter — 4. *C. trilocularis*

1. Corchorus hochstetteri *Milne-Redh.*

Erect hirsute annual herb with lanceolate to narrowly obovate leaves; inflorescences of 1–3 yellow flowers in cymes subopposite the leaves.

A plant of seasonally wet black-cotton soils, often found near rivers. It is easily identified by its echinate fruits. HA, KIS, MAC, NBI, KAJ.
Verdcourt 3176; Bogdan 4372.

2. Corchorus tridens *L.*

A glabrous to sparsely pilose, erect or prostrate annual similar to *C. hochstetteri* except for the oblong to lanceolate leaves; inflorescence of 1–3-flowered leaf-opposed cymes.

A weed of cultivation which so far has been recorded only from a swamp near Magadi in our area. MAG.
Williams B 5230.

3. Corchorus olitorius *L.*

Erect glabrescent annual with ovate to lanceolate leaves and 2–3-flowered cymes opposite the upper leaves.

A plant of seasonally wet ground but more often a weed of cultivation. It yields the 'Jute' fibre and is easily distinguished from other species of the genus in our area by its 5-valved capsule. KIS, MAG, NBI.

Bally 8021.

4. Corchorus trilocularis *L.*

A glabrous to setulose-pilose, herbaceous or woody annual with lanceolate to oblong or narrowly oblong leaves.

A common weed of wet areas especially along rivers and lakes. HM, KIT, MUM, KIS, NAR, EMB, NBI.

Kerfoot 4717.

2. SPARRMANNIA *L. f.*

Stellate-pubescent to softly tomentose or glabrescent shrubs or small trees; leaves alternate, petiolate, stipulate, deeply palmately lobed. palmately veined, with margins crenate-dentate to serrate; stipules deciduous, filiform; inflorescence an axillary or extra-axillary umbel on an elongated peduncle; bracts similar to stipules; flowers bisexual, regular, tetramerous; sepals lanceolate, deciduous; petals oblanceolate, eglandular; stamens numerous, free, outer ones sometimes sterile and moniliform; ovary 4–5-celled, with numerous ovules in each cell; stigma 4–5-toothed; capsule 4–5-valved, covered with rigid prickles.

Sparrmannia ricinocarpa (*Eckl. & Zeyh.*) *Kuntze* (see p. 189)

A pubescent, much branched, erect or scrambling shrub with 3–7-lobed cordate suborbicular to ovate leaves; flowers white and purplish.

A common plant of high rainfall areas, often found at edges, along paths and in clearings of upland forests. HE, HC, HT, HM, HL, HA, HK, KIT, KIS, MAC, NBI, KAJ.

Lind and Agnew 5009; Gillett 18291.

3. TRIUMFETTA *L.*

Herbs or shrubs with entire or lobed, serrate or crenate, petiolate leaves, often many-nerved from base; stipules lateral; inflorescences in terminal cymes or at the nodes; sepals 5, each usually with a short appendage at or near the apex; stamens 4–10, inserted on an androgynophore or torus; ovary 2–5-celled with 2 ovules in each cell or falsely 10-celled by intrusion of false septa; fruit a capsule, 3–5-valved or indehiscent, usually globose, echinate or setose; seeds 1–2 per cell, with brown and somewhat leathery testa; embryo straight.

1 Leaves digitately 3–5-partite — 1. *T. longicornuta*
  Leaves undivided or shallowly lobed — 2
2 Fruit to 8 mm long including prickles — 3
  Fruit 10 mm or more in diameter including prickles — 5
3 Fruit globose; prickles spreading, glabrous — 2. *T. rhomboidea*
  Fruit ovoid or conical; prickles incurved-ascending, hairy — 4
4 Shrub; prickles terminated by one to several spinules, stellate-pubescent; sepals not hooded towards apex — 3. *T. flavescens*
  Annual herb; prickles terminated by a single hooded spine, densely ciliate on one side; sepals hooded towards apex — 4. *T. pentandra*
5 Petiole hairy on upper side only — 5. *T. annua*
  Petiole densely hairy on all sides — 6
6 Most prickles straight or slightly curved at apex — 6. *T. tomentosa*
  Most prickles hooked or falcate at apex — 7
7 Leaves mostly undivided, lanceolate; sepals 7–10 mm long — 7. *T. pilosa*
  Leaves mostly tricuspidate, ovate; sepals 10–15 mm long — 8. *T. macrophylla*

1. Triumfetta longicornuta *Hutch. & Moss*

A densely golden-stellate, much branched erect undershrub with digitately 3–5-lobed leaves and lanceolate or oblanceolate leaf segments; cymes crowded towards the apices of branches; capsule globose with very numerous and closely packed prickles each with 1–3 fine setae at apex which are easily rubbed off.

A locally common plant of open woodlands and grasslands, often along roadsides. It is much in need of further collection. EMB, MAC.

Lyne Watt 1165; Gillett 16836.

2. Triumfetta rhomboidea *Jacq.* (see p. 184)

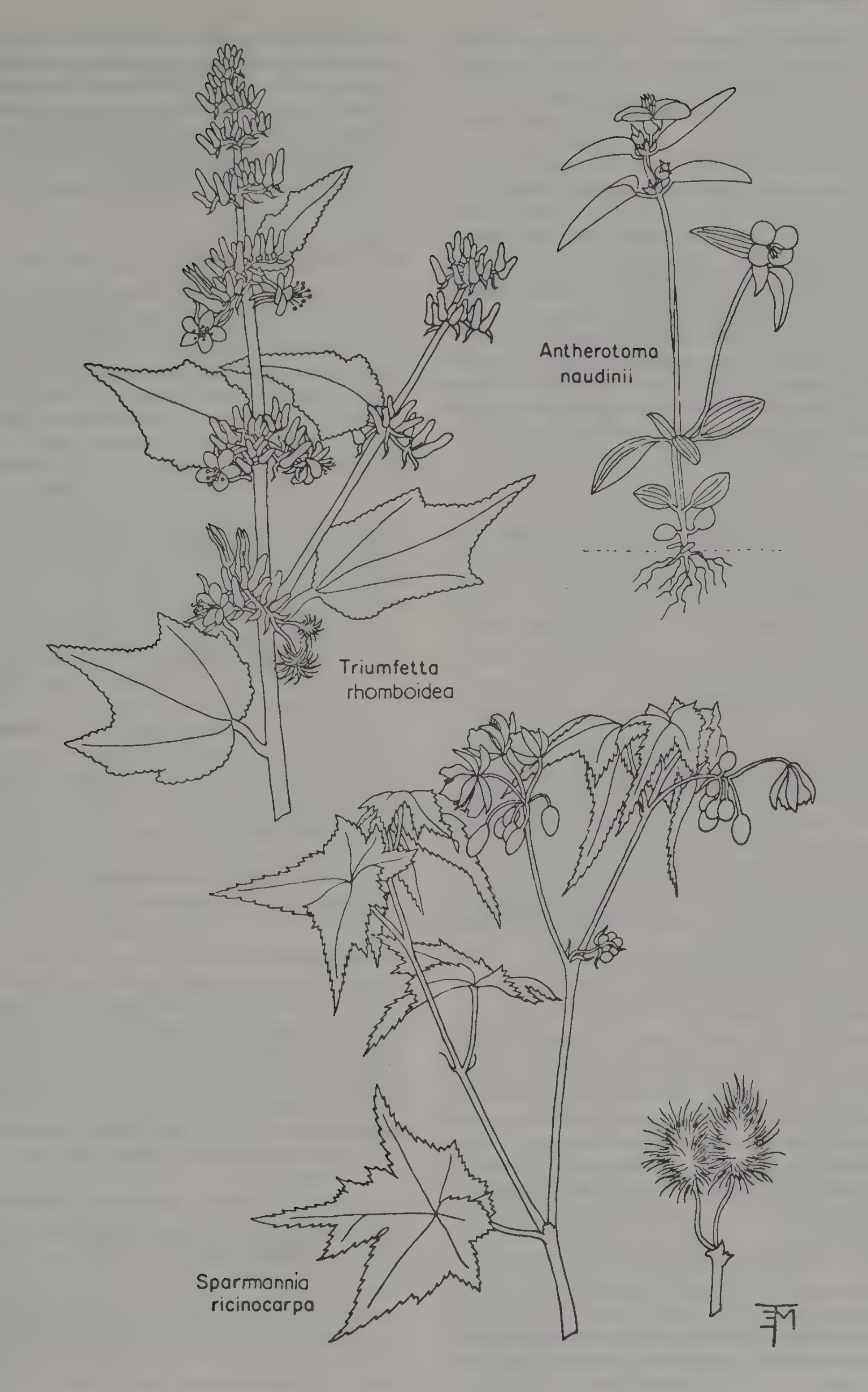
Erect pubescent herb or undershrub with ovate to ovate-lanceolate, often 3-lobed leaves, and cymes in small crowded clusters at upper nodes; capsule with hooked glabrous prickles 1 mm long.

This polymorphic species commonly occurs along paths and roadsides in upland forests, dry country, and grassland. Often a weed of cultivation. HE, HC, HA, KIT, MUM, KIS, NAR, EMB, MAC, NBI.

Hanid and Kiniaruh 937; Faden 66233.

3. Triumfetta flavescens *A. Rich.*

A pubescent shrub with branches often densely covered with small black dots, leaves ovate to suborbicular, somewhat angular or slightly trilobed; inflorescences lax, of small clusters of cymes; capsule with incurved stellate-pubescent prickles 1 mm long.


Antherotoma
naudinii
Triumfetta
rhomboidea
Sparmannia
ricinocarpa

A common plant in dry bush country, apparently more common in Magadi area. KIS, RV, MAG, MAC, KAJ.
Harmsen 6481; Verdcourt 3867.

4. Triumfetta pentandra *A. Rich.*

Erect pubescent sparsely branched annual with rhomboid-orbicular to ovate or obovate, mostly undivided but often distinctly or obscurely 3-lobed leaves and terminal inflorescences of crowded cymes; capsule with ascending, densely ciliate hooked prickles 1–2 mm long.

A rare plant of waste places which is very like *T. rhomboidea* in general appearance. It differs from the latter in the fruit which is ovoid not globose and in the prickles which are densely ciliate below the uncinate apices. BAR, MAC.
Leippert 5070.

5. Triumfetta annua *L.*

Sparsely crisped pubescent to glabrescent erect annual with ovate leaves and inflorescences of 1–5 cymes clustered at nodes; fruit with hooked glabrous or pilose prickles 3–5 mm long.

A shade-loving plant of forest edges but also occurring as a ruderal or weed of cultivation. KIT, RV, NBI, KAJ.
Agnew 9421; Bally 117.

6. Triumfetta tomentosa *Boj.*

A low shrub with brown woolly indumentum and ovate or lanceolate-ovate, sometimes slightly 3-lobed leaves; cymes in crowded terminal panicles; capsule with slightly curved pilose or almost glabrous prickles 3–9 mm long.

A common plant of forest clearings and old cultivation. HE, HM, HA, KIT, MUM, EMB, MAC, NBI, KAJ.
Strid 2627; Bogdan 4845.

7. Triumfetta pilosa *Roth.*

An erect woody herb or small shrub with lanceolate to ovate-lanceolate leaves and loose terminal inflorescences of small yellow flowers crowded in leafy cymes at the nodes; capsule globose, mostly pilose with apically hooked prickles.

A locally common plant of forest margins and old cultivation. HA, KIT, MUM, EMB, KAJ.
Williams 278.

8. Triumfetta macrophylla *K. Schum.* (see p. 189)

A pubescent erect much-branched woody herb or shrub with ovate or lanceolate and often undivided leaves and large, sparsely leafy terminal panicles of numerous cymes; capsule with hooked glabrous or pilose prickles 3–7 mm long.

Our commonest *Triumfetta* which is mostly encountered at edges and along roadsides of upland forests. It varies considerably in the shape and size of leaves and also in habit as it often behaves as a scrambler. HE, HC, HM, HA, HK, HN, KIT, MUM, KIS, NAR, EMB, MAC, NBI.
Hanid and Kiniaruh 1053; Bogdan 4539.

50. STERCULIACEAE†

Herbs, shrubs, and trees with stellate hairs and alternate, stipulate, simple or rarely compound leaves; flowers in cymes or racemes, regular, bisexual or unisexual, pentamerous; sepals 5; petals 5 or absent, contort, often asymmetric; stamens 5–many, the filaments united into a ring below, if 5 then these opposite the petals and often alternating with staminodes; ovary of 5 (rarely fewer) free or fused carpels, if the latter, then often separating in fruit; fruit of follicles or a capsule; seeds few to many, with or without endosperm.

A family of many important trees in Kenya, which are dealt with in KTS. Here only the herbaceous genera are keyed out.

1 Flowers each less than 6 mm long, crowded into tight, usually axillary clusters — 2
Flowers clearly separate from each other, rarely less than 6 mm long — 3
2 Leaves stellate-pubescent or woolly; fruit enclosed within the petals — 3. *Waltheria indica*
Leaves glabrescent or with simple hairs on veins only; fruit free from flower parts — 4. *Melochia corchorifolia*
3 Epicalyx of 3 bracts present — 2. *Melhania*
Epicalyx of 3 bracts absent — 1. *Hermannia*

1. HERMANNIA *L.*

Herbs or small shrubs with stellate hairs and simple serrate leaves with prominent venation; flowers bisexual, racemose; sepals 5, connate at base; petals 5; stamens 5, opposite the petals, with sagittate anthers, the filaments ± connate at base; ovary sessile, of 5 connate carpels with axile placentation; fruit a capsule; seeds numerous.

1 Flowers pink or white; capsules awned at apex — 2
Flowers yellow; capsules smooth at apex — 3
2 Bracteoles clearly visible on upper half of pedicel; fruit with ascending awns — 1. *H. viscosa*
Bracteoles absent from the articulation of the pedicel; fruit with spreading awns — 2. *H. kirkii*

† By A. D. Q. Agnew.

3 Filaments expanded midway into two lateral lobes 3. *H.* sp. *A*
Filaments simple 4
4 Inflorescence a terminal or lateral panicle of more than 40 flowers 5
Inflorescence small, lateral, often umbelliform, of fewer than 15 flowers 4. *H. uhligii*
5 Stipules ovate 5. *H. exappendiculata*
Stipules linear 6. *H. oliveri*

1. Hermannia viscosa *Hiern*

An erect glandular-pilose annual or rarely perennating herb with ovate to lanceolate leaves and axillary flowers; petals a little longer than sepals, white with a pink base or pink, spreading.

A rare plant found in dry country, mainly in the Rift Valley. RV, MAG.

Glover 4127.

2. Hermannia kirkii *Mast.*

Similar to the above except for the generally narrower, lanceolate to oblong, rarely linear leaves; the petals usually twice as long as the calyx and usually pink-purple, and the awns on the capsule spread at right angles to the axis, not ascending.

An uncommon plant found in dry *Acacia* bushland, often in disturbed places. BAR.

Bogdan 4241.

3. Hermannia *sp.* **A.** (see p. 192)

A stellate-pubescent, erect much branched shrub with oblong leaves and panicles of yellow flowers.

Common only around Machakos where it grows within and at edges of *Combretum* woodland in sandy soils on basement complex rocks. MAC.

Agnew 9395; van Someren 4790.

4. Hermannia uhligii *Engl.* (Incl. *H. alhiensis* K. Schum. of Check List)

A grey-pubescent upright or semi-prostrate shrub with oblong leaves and axillary panicles of 5–15 yellow flowers.

A common and conspicuous plant after the long rains in the dry grassland and bushland plains around Nairobi. The large-flowered forms have been named *H. alhiensis* K. Schum but these appear to grade into the small-flowered specimens which grow in the same places. NAR, RV, MAG, MAC, NBI, KAJ.

Heriz-Smith, March 1962; Verdcourt 3844.

5. Hermannia exappendiculata (*Mast.*) *K. Schum.*

Similar to *H. oliveri* but with broad stipules, smaller leaves, and looser fewer-flowered panicles usually glandular-pilose on the rachis and calyx.

Locally common in *Commiphora* bushland in dry areas. MAC, KAJ.

Bally 712; Agnew and Hanid 8334.

6. Hermannia oliveri *K. Schum.*

A loose pubescent to grey-canescent shrub with ovate-oblong leaves and large terminal panicles of yellow flowers.

A local plant of dry *Commiphora* bushland. MAC, KAJ.

Lind and Agnew 5694; Beckley 15.

2. MELHANIA *Forsk.*

Perennial herbs (sometimes short-lived) or shrubs, usually densely stellate-tomentose, with entire, serrate leaves; flowers bisexual, in axillary cymes or solitary, yellow; epicalyx of 3 free bracts; sepals 5, free; petals 5, asymmetric; stamens 5, opposite the petals, connate at base and alternating with 5 ligulate staminodes; ovary sessile, tomentose, of 5 fused carpels, with axile placentation and 1-several seeds per loculus; fruit a capsule; seeds with a smooth or rough testa.

1 Young stems and leaves grey-white canescent; epicalyx bracts lanceolate 1. *M. ovata*
Young stems and leaves reddish to orange tomentose; epicalyx bracts broad-ovate 2. *M. velutina*

1. Melhania ovata (*Cav.*) *Spreng.*

A grey-canescent woody herb or low shrub with ovate or suborbicular leaves and axillary groups of 1–3 sulphur-yellow flowers.

A common roadside weed in dry grassland, where it can be mistaken for a *Sida* at first sight. RV, EMB, MAG, KAJ.

Agnew and Azavedo 9329.

2. Melhania velutina *Forsk.* (see p. 192)

A rusty-tomentose erect woody annual or short-lived loose perennial with ovate-elliptic leaves and axillary groups of 1–4 yellow flowers.

A common weed in the drier areas of Kenya, below 6000 ft. MUM, KIS, NAR, RV, NAN, MAC, NBI, KAJ.

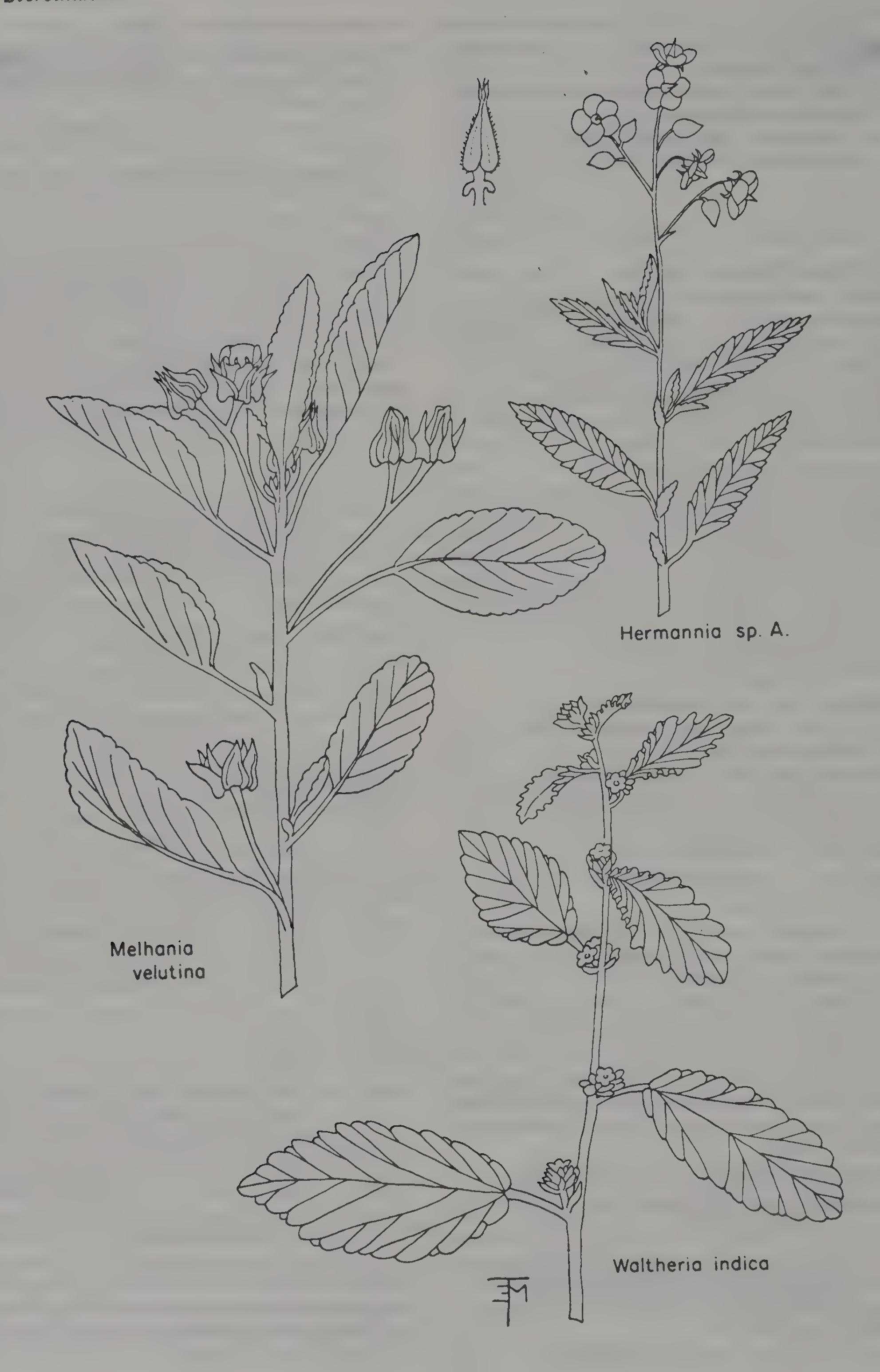
Agnew 8742.

3. WALTHERIA *L.*

Herbs or small shrubs with stellate hairs and simple, serrate leaves; flowers small, bisexual, in crowded panicles, basically cymose, with bracts and bracteoles; sepals 5, connate; petals 5, persistent; stamens 5, opposite the petals and with the filaments united into a tube; ovary of one carpel, with 2 ovules; fruit a follicle.

Waltheria indica *L.* (see p. 192)

An erect, stellate-pubescent woody annual or short-lived herb with ovate-oblong leaves and terminal clusters of yellow flowers.


Hermannia sp. A.
Melhania velutina
Waltheria indica

A common weed of dry places, 4500–7000 ft in our area, frequently in disturbed lands. It is very variable in habit. MUM, KIS, NAR, EMB, MAC, NBI, KAJ.

Hanid and Kiniaruh 664.

4. MELOCHIA *L.*

Herbs or shrubs with simple leaves and small bisexual flowers in dense cymose clusters; bracts and bracteoles present, linear; calyx ± inflated, 5-lobed; petals 5, free, deciduous in fruit; stamens 5, with filaments fused into a tube, without staminodes; ovary 5-celled, with 2 ovules in each cell; fruit a globose capsule.

Melochia corchorifolia *L.*

An erect, woody annual with glabrescent or sparsely simple-hairy ovate leaves, each subtending 2 lines of stellate hairs on the stem below the nodes; flowers in dense terminal or lateral clusters; petals white with a yellow base.

A tropical weed of the old world; rare in our area and only once recorded from Kisumu. KIS.

Kokwaro 1662.

51. MALVACEAE†

Herbs or shrubs, rarely trees, usually with stellate hairs and alternate, stipulate, palmately-nerved leaves; inflorescences racemose or more commonly the flowers solitary; flowers regular, bisexual; calyx 5, often with an epicalyx of a variable number of bracts below it; petals 5, contort, joined above the base to a hollow tube of filaments which is the staminal column; anthers many, 1-thecous; ovary superior, of fused or free carpels, with axile placentation when fused, each with 1-many ovules; fruit a capsule or of follicles or achenes; seeds with endosperm.

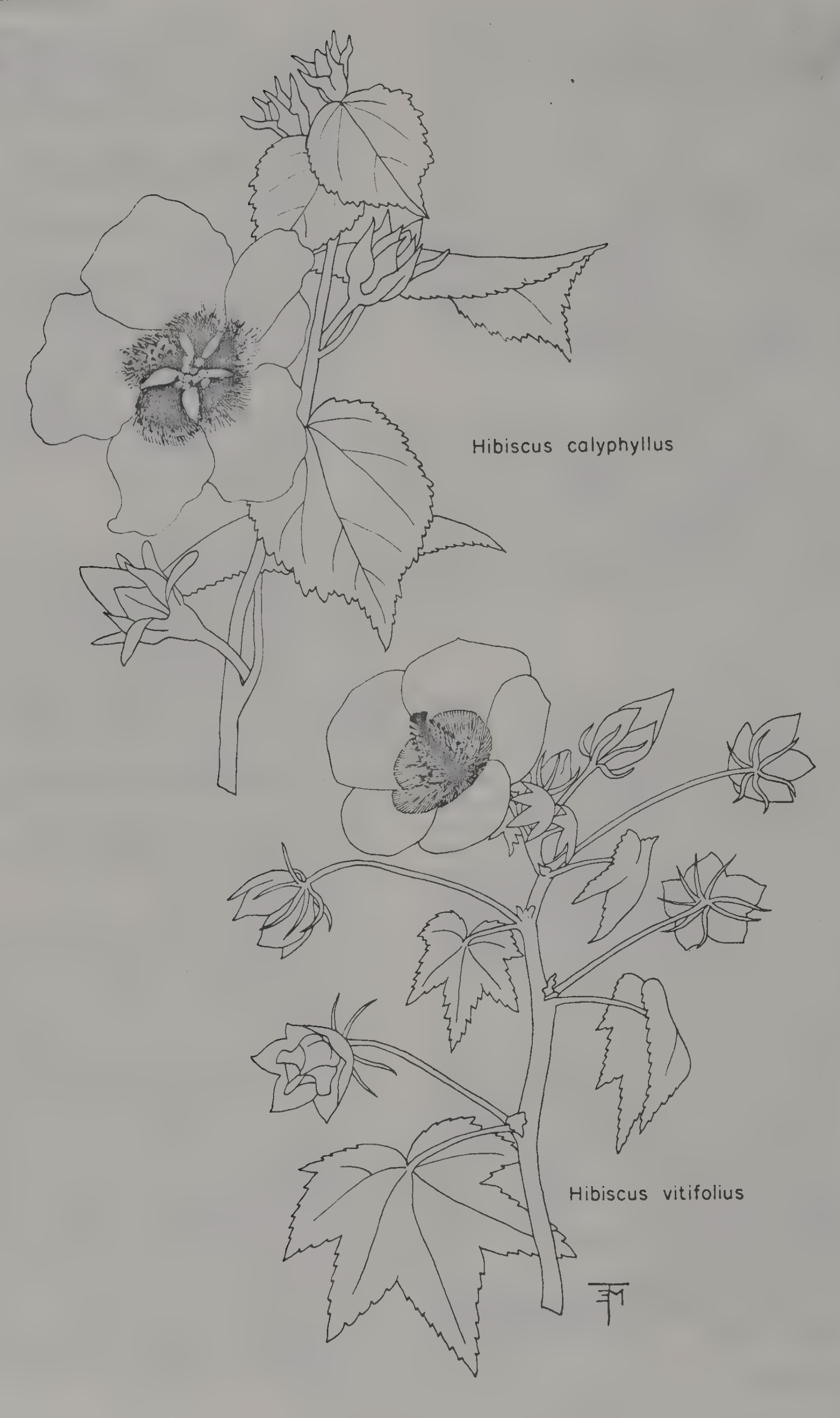
1 Epicalyx present — 2
  Epicalyx absent — 6
2 Epicalyx bracts connate into a lobed structure resembling the true calyx; fruits of mericarps, densely covered with glochidiate spines — 6. *Urena lobata*
  Epicalyx of free bracts; fruit a capsule or of mericarps without or with 2–3 glochidiate spines only — 3
3 Epicalyx of 3 bracts only — 5. *Malva*
  Epicalyx of more than 3 bracts — 4
4 Fruit a dehiscent capsule — 5
  Fruit of 1-seeded mericarps — 7. *Pavonia*
5 Flowers pink or purplish; fruit winged with 1-seeded loculi — 2. *Kosteletzkya*
  Flowers rarely pink or purplish; fruit seldom winged, always with more than 1 seed per loculus — 1. *Hibiscus*
6 Upper leaves deeply tripalmatisect or trifoliolate — 7
  All leaves simple or shallowly lobed — 8
7 Trailing herb of montane rain-forest; fruit of mericarps — 3. *Sida ternata*
  Erect annual of dry bushland below 4000 ft; fruit a capsule — 1. *Hibiscus*
8 Fruit of hard indehiscent mericarps — 3. *Sida*
  Fruit of soft dehiscent mericarps — 9
9 Fruit of 5 mericarps which are constricted in the middle and spreading at the apex; flowers less than 25 mm diameter — 8. *Wissadula rostrata*
  Fruit of 10 or more mericarps which are not constricted; flowers usually more than 25 mm in diameter — 4. *Abutilon*

† By A. D. Q. Agnew.

1. HIBISCUS *L.*

Annual or perennial herbs or shrubs with usually palmately lobed serrate leaves; flowers usually solitary, regular or, by declination of the staminal column, zygomorphic; pedicels usually articulated; epicalyx usually present; calyx sometimes enlarged in fruit; petals usually showy; ovary of 5 fused carpels with axile placentation; stigmas 5, free, capitate; fruit a loculicidal dry capsule with more than 2 seeds per loculus.

1 Epicalyx absent; upper leaves trifoliolate — 1. *H. sidiformis*
  Epicalyx present; all leaves simple — 2
2 Epicalyx bracts very narrow, stiff or subulate, not flat — 3
  Epicalyx bracts flat — 13
3 Capsule winged or apiculate when mature — 4
  Capsule globose, without ornamentation — 6
4 Capsule winged — 5
  Capsule apiculate, the valves awned after dehiscence — 2. *H. palmatus*
5 Pedicels articulated above the middle; flowers yellow with maroon centre — 3. *H. vitifolius*
  Pedicels articulated below the middle; flowers pink to reddish-purple — 4. *H.* sp. *D*
6 Calyx tube inflated in fruit, papery with purple veins — 5. *H. trionum*
  Calyx tube sometimes enlarged in fruit, never inflated, nor papery with purple veins — 7
7 Staminodes present at base of staminal column; blackish hairs prominent on bent articulation of pedicel and above, as well as often elsewhere on the plant — 6. *H. fuscus*
  Staminodes absent; blackish hairs usually absent and if present then the pedicel not bent at the articulation — 8


Hibiscus calyphyllus
Hibiscus vitifolius

8 Staminal column bearing stamens all the way down to the expanded base 9
Staminal column with lower part smooth and without stamens 10
9 Petals crimson, more than 1 cm long, spreading at anthesis 7. *H. aponeurus*
Petals pink or becoming pink, never crimson, usually less than 1 cm long, reflexed at anthesis 8. *H. micranthus*
10 Petals pink or turning pink with age 11
Petals white or cream, not turning pink with age 12
11 Leaf surface obscured by thick tomentum of stellate hairs; calyx with dark brown indumentum at least at base 9. *H.* sp. *A*
Leaf surface visible through a thin pubescence; calyx hairs white or colourless 8. *H. micranthus*
12 Petals more than 12 mm long; fruiting calyx longer than fruit 10. *H. flavifolius*
Petals less than 10 mm long; fruiting calyx shorter than fruit 11. *H.* sp. *B*
13 Epicalyx bracts 5 14
Epicalyx bracts 6 or more 17
14 Style and stigma over 4 cm long, almost equalling the petals 15. *H. macranthus*
Style and stigma less than 4 cm long, much shorter than petals 15
15 Calyx enlarging in fruit to 3 cm long or more 13. *H.* sp. *C.*
Calyx not enlarging in fruit 16
16 Epicalyx lobes elliptic, ± abruptly constricted below the middle and spreading or at least undulate 12. *H. calyphyllus*
Epicalyx lobes linear-lanceolate, not abruptly constricted, not spreading nor undulate 14. *H. lunariifolius*
17 Stem with prickly hairs on enlarged bases; calyx with a large gland in the middle of each lobe 18
Stem without spines; calyx without glands 21
18 Stipules broad-ovate; epicalyx bracts bifid 16. *H. surattensis*
Stipules linear; epicalyx bracts simple 19
19 Erect annual, often single-stemmed to 1 m 17. *H. cannabinus*
Shrubby perennial with spreading/ascending unbranched flowering stems 20
20 Stem-spines conical, woody, often 2 mm broad at base 18. *H. greenwayi*
Stem-spines small, not conical, less than 1 mm wide at base 19. *H. diversifolius*
21 Pedicels articulated at or above the middle 22
Pedicels articulated (obscurely) at base 20. *H. aethiopicus*
22 Epicalyx bracts spathulate; leaves tomentose 21. *H. panduriformis*
Epicalyx bracts linear; leaves almost glabrous 23
23 Flowers in leafless terminal racemes 22. *H. corymbosus*
Flowers solitary, axillary 23. *H. articulatus*

1. Hibiscus sidiformis *Baill.*

Erect tomentellous annual with orbicular, crenate, simple lower leaves, and palmately trifoliolate upper leaves; petals white or yellow.

A rare plant found in dry country, only once doubtfully recorded for our area, at Koboko, so it requires confirmation. KAJ.

Ossent 558.

2. Hibiscus palmatus *Forsk.*

Sparsely setose annual with deeply 5–7-palmatisect leaves and solitary flowers; petals pale yellow to orange, with pink or darker centre.

An uncommon plant found in dry bushland on sandy soils, and entering our area only at the drier eastern end. MAC, KAJ.

Verdcourt 2587B.

3. Hibiscus vitifolius *L.* (see p. 194)

A loose shrub with spreading branches, usually glandular-pilose and stellate-hairy (the hairs irritant as in *H. macranthus*); leaves suborbicular-pentagonal in outline, shallowly 3–5-lobed; flowers in loose terminal racemes; petals yellow with maroon base.

Locally common in Upland Kenya at the edges of drier forest formations. HC, HT, HA, HK, MUM, NAR, BAR, RV, MAG, MAC, NBI, KAJ.

Harmsen 6522; Glover 3023.

4. Hibiscus *sp.* **D.**

Similar to *H. vitifolius* but an erect herb with larger leaves and red/pink flowers with longer petals (to 7 cm) and longer staminal tube (to 2·5 cm) on pedicels articulated below the middle; seeds ± covered with fimbriate scales.

Replacing *H. vitifolius* in dry *Commiphora* woodland and at the coast. MAC, KAJ.

Agnew and Lind 5697; Napper 1264.

5. Hibiscus trionum *L.*

Stellate-hispid annual herb with orbicular, deeply 3–7-palmatilobed leaves; flowers solitary, axillary; petals white or yellow with a dark crimson spot at base.

An uncommon weed found in disturbed places in dry country below 7500 ft. HT, HM, HA, KIS, BAR, MAG, NAN, MAC, NBI.

Gillett 16557; Napier 733.

6. Hibiscus fuscus *Garcke* (see p. 197)

An erect sparsely branched woody herb or shrub with brownish-black stellate hairs on stem, pedicels and calyx; colourless hairs on leaves and epicalyx; leaves ovate-triangular, simple or rarely 3-lobed; flowers solitary, axillary; petals white or pale purple.

Found from 5000 to 8000 ft in our area, this is a very common weed of disturbed ground where it appears to be a short-lived perennial with small flowers. It is also found in more natural surroundings in grassland, especially in the Rift Valley, as a branched shrub with large, sometimes coloured flowers. Further work is needed to elucidate the relationship between these two forms. HE, HC, HT, HM, HL, HA, HK, KIT, MUM, KIS, NAR, RV, NAN, EMB, MAC, NBI, KAJ.

Glover 2126; Agnew 5436.

7. Hibiscus aponeurus *Sprague & Hutch.* (see p. 198)

An erect short-lived perennial with an often dense indumentum of yellowish to occasionally brownish hairs; leaves oblong to ovate; flowers solitary, axillary, crimson.

Common in dry grasslands from 2000 to 6500 ft where its bright crimson flowers make it very conspicuous. HE, HC, HM, HA, KIT, MUM, KIS, NAR, RV, MAG, NAN, EMB, MAC, NBI.

Elliott 84 (syntype); Kerfoot 2230; Agnew and Musumba 5331.

8. Hibiscus micranthus *L. f.* (see p.198)

A stiff, slender, loosely pubescent perennial shrub, with oblong to ovate leaves; flowers solitary, axillary; petals white becoming pink, or pink with paler base.

A very variable species as defined here as there are two clear races with a few intermediates so that a consistent separation is apparently impossible. Further work is necessary to determine their relationship. The races are as follows:

1. Calyx lobes short-triangular, shorter than or as long as tube; staminal tube never more than 4 mm long with stamens present at base. Coastal and dry inland bushland. BAR, MAC, KAJ.

Napper 1260; Agnew 5667.

2. Calyx lobes lanceolate, longer than the tube; staminal tube always more than 4 mm long with naked base and stamens only at apex. Mostly inland dry grassland and rocky bushland to 4500 ft. MUM, KIS, BAR, RV, MAG, EMB, MAC, KAJ.

Greenway 9508; Agnew and Hanid 8350.

9. Hibiscus *sp.* **A.**

Erect shrub with dense felty tomentum on all parts and orbicular to subreniform leaves; flowers solitary, pink to red.

A rare plant found only in rocky dry grassland at the south end of our Rift Valley area (Kedong). RV.

Rogers 63.

10. Hibiscus flavifolius *Ulbr.* (see p. 200)

Similar to *H. aponeurus* in general, but bigger, with ovate-orbicular leaves and cream or white flowers.

Locally abundant in dry rocky grassland at medium altitudes. MUM, NAR, RV, MAC, KAJ.

Agnew and Musumba 5452; Glover 826.

11. Hibiscus *sp.* **B.**

Similar to *H. flavifolius*, but all parts smaller and the calyx lobes not enlarging in fruit, overtopped by the *c.* 8 mm diameter capsule.

Locally common in dry grassland, often growing with *H. flavifolius* but much less common than that species. MUM, KIS, RV, MAG, MAC.

Fox and Napier 6695; Agnew and Hanid 9262.

12. Hibiscus calyphyllus *Cav.* (see p. 194)

Tomentose shrub with ovate-cordate, simple or shallowly 3-lobed leaves; flowers solitary on short pedicels articulated at the base; petals yellow with a maroon patch at base of each.

Occasional in lowland dry woodland and evergreen woodland, 3000–6000 ft. HE, HA, KIT, MUM, NAR, RV, MAC, NBI, KAJ.

Agnew 7574; Padwa 30.

13. Hibiscus *sp.* **C.** (see p. 197)

Similar to *H. macranthus* except for the terminal leafless racemes and the parallel-sided calyx lobes which enlarge in fruit.

This shrub is very unpleasant to walk through or handle owing to its irritant hairs which break off in the skin. It is found in roadsides and cleared forest, 6600–9000 ft. HE, HT, HM, HA, HK, KIT.

Ables 86; Nattrass in EAH 10 237.

14. Hibiscus lunariifolius *Willd.*

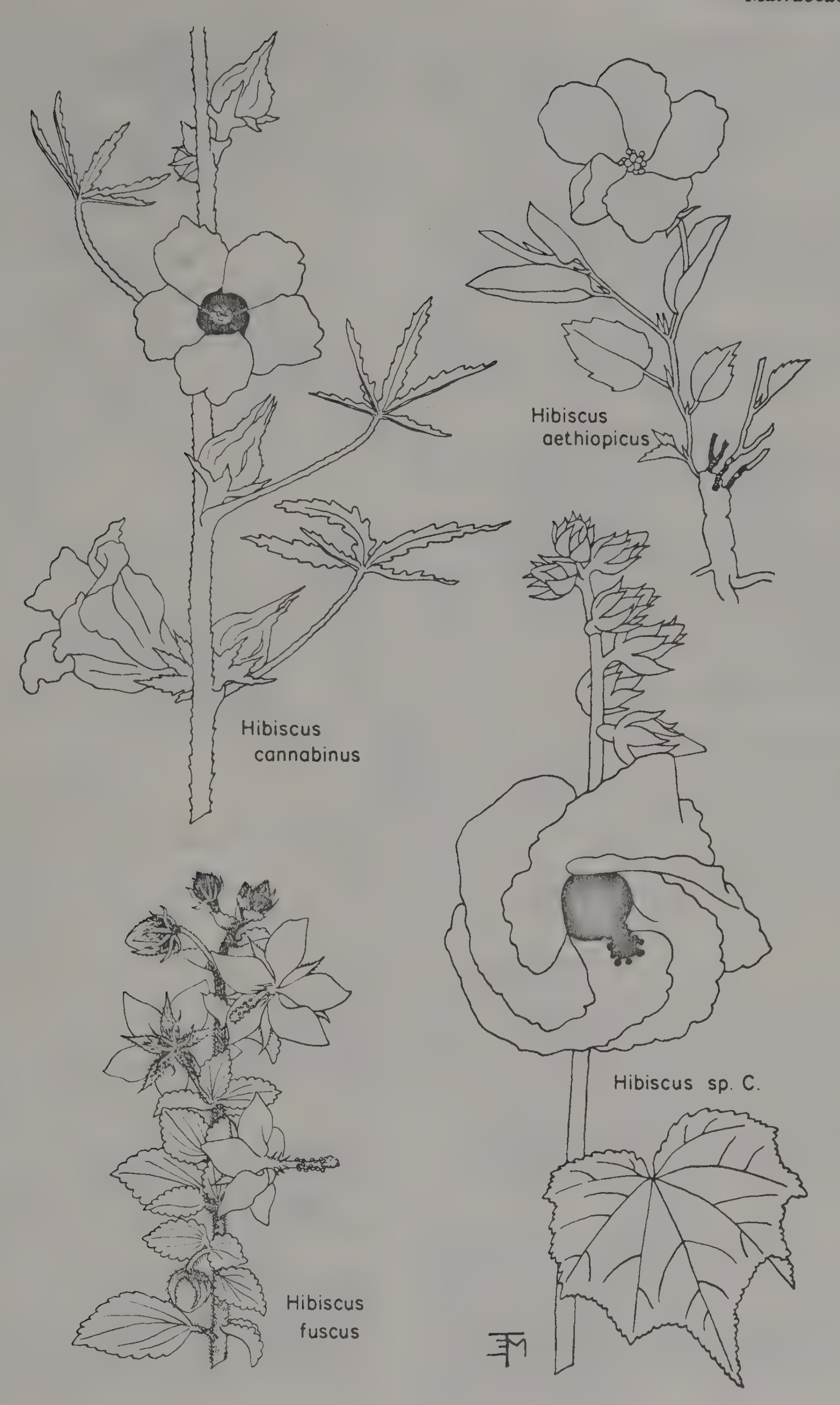
Similar to *H. macranthus* except for the usually smaller leaves and key characters.

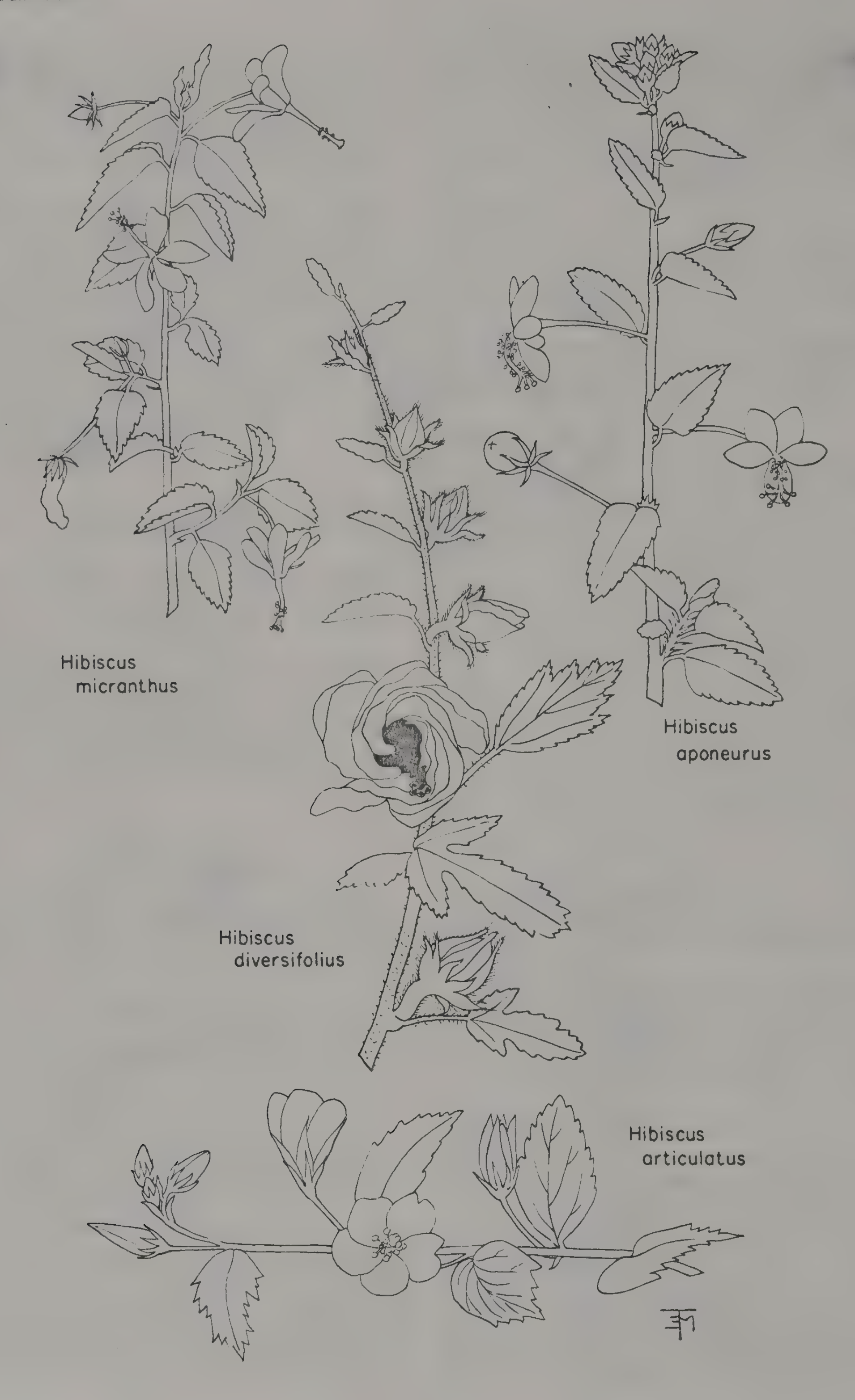
This plant is found in dry country, especially rocky bushland. MUM, KIS, RV, MAG, KAJ.

Greenway 8506.

15. Hibiscus macranthus *A. Rich.*

Usually a small shrub with erect branches, but sometimes larger and trailing, the whole plant pilose and with frequent sharp irritant hairs which


Hibiscus
aethiopicus
Hibiscus
cannabinus
Hibiscus sp. C.
Hibiscus
fuscus


Hibiscus micranthus
Hibiscus aponeurus
Hibiscus diversifolius
Hibiscus articulatus

break off in the skin; leaves ovate-triangular to pentagonal, sometimes obscurely lobed; flowers in leafless racemes, or solitary axillary; petals yellow with maroon base.

A common *Hibiscus* with drooping flowers which never open fully, found 5000–8000 ft in cleared forest grassland. HE, HT, HM, HA, MUM, KIS, RV, KAJ.

Paulo 543; Agnew 8712.

16. Hibiscus surattensis *L.*

A large annual with small prickles on stem, petioles and leaf midrib; leaves orbicular to ovate, palmately 3–7-lobed; epicalyx lobes forked into an inner erect linear branch, and an outer spreading spathulate branch; petals yellow with purple base.

A rare weed, apparently not maintaining itself in our area, but found more commonly at the coast. HM, MAC, NBI.

Bogdan 4844.

17. Hibiscus cannabinus *L.* (see p. 197)

An erect pubescent annual with small spines on the stems; leaves orbicular, shallowly to deeply 3–5-palmatilobed; flowers pendulous in loose terminal racemes; petals grey-purple, purple, or yellow with maroon or purple base.

Locally common in dry grassland. HT, HA, KIT, MUM, KIS, NAR, RV, MAG, EMB, MAC, NBI.

Agnew and Musumba 7963.

18. Hibiscus greenwayi *Baker.*

A prickly-stemmed shrub with many long unbranched stems bearing orbicular 5–7-lobed leaves; flowers yellow with maroon centre.

Abundant in the dry coastal scrub, this species only enters our area in dry *Commiphora* woodland. EMB, MAC.

Lind and Agnew 5639; Napper 1657.

19. Hibiscus diversifolius *Jacq.* (see p. 198)

This species is similar to *H. cannabinus* but is a shrub (or even a small tree in some places), usually with shallowly lobed pilose leaves and a densely pilose calyx; petals mostly yellow.

This is, like the last species, a very variable plant with respect to its leaves and flower colour, and the woody, shrubby habit is the feature consistently distinguishing it from *H. cannabinus*. HE, HC, HT, HM, HL, HA, HK, KIT, RV, EMB, MAC, NBI.

Agnew and Hanid 8387; Nattrass 974.

20. Hibiscus aethiopicus *L.* (see p. 197)

Low perennial hispid herb, with elliptic-oblong, rarely 3-lobed leaves; flowers solitary on unarticulated pedicels, yellow.

A common plant of shallow soil or hard clay grassland, appearing only after rain, when the flowers are very ornamental. HC, HL, KIT, NAR, MAC, NBI, KAJ.

Agnew and Hanid 7515; Stewart 319.

21. Hibiscus panduriformis *Burm. f.*

Woody tomentose herb or soft shrub with ovate, pentagonal or shallowly lobed leaves; flowers on short pedicels articulated about the middle in loose terminal racemes; petals yellow with a purple centre.

Common near water in hot country, and at the coast. MUM, KIS, BAR, EMB.

Crowe 1147; Hanid and Kiniaruh 748.

22. Hibiscus corymbosus *Hochst.*

Perennial pubescent herb, rather variable in habit, with shortly ovate to oblong, simple or shallowly 3-lobed leaves; flowers in terminal racemes, yellow, sometimes externally flushed pink.

An uncommon plant found in burnt dry grassland in our area, where it has been picked up in a number of scattered localities. It much resembles a paler form of *H. aethiopicum* when it grows prostrate in shallow-soil grassland. MUM, KIS, EMB.

Verdcourt 3747; Hanid and Kiniaruh 807.

23. Hibiscus articulatus *Hochst.* (see p. 198)

A perennial herb with low, ascending stems to 30 cm, similar to *H. corymbosus* except for the habit, the almost glabrous leaves and the solitary axillary smaller flowers.

A rare plant found in burnt grassland on shallow or clay soils. MAC, KAJ.

Agnew 9150; Bally 7692.

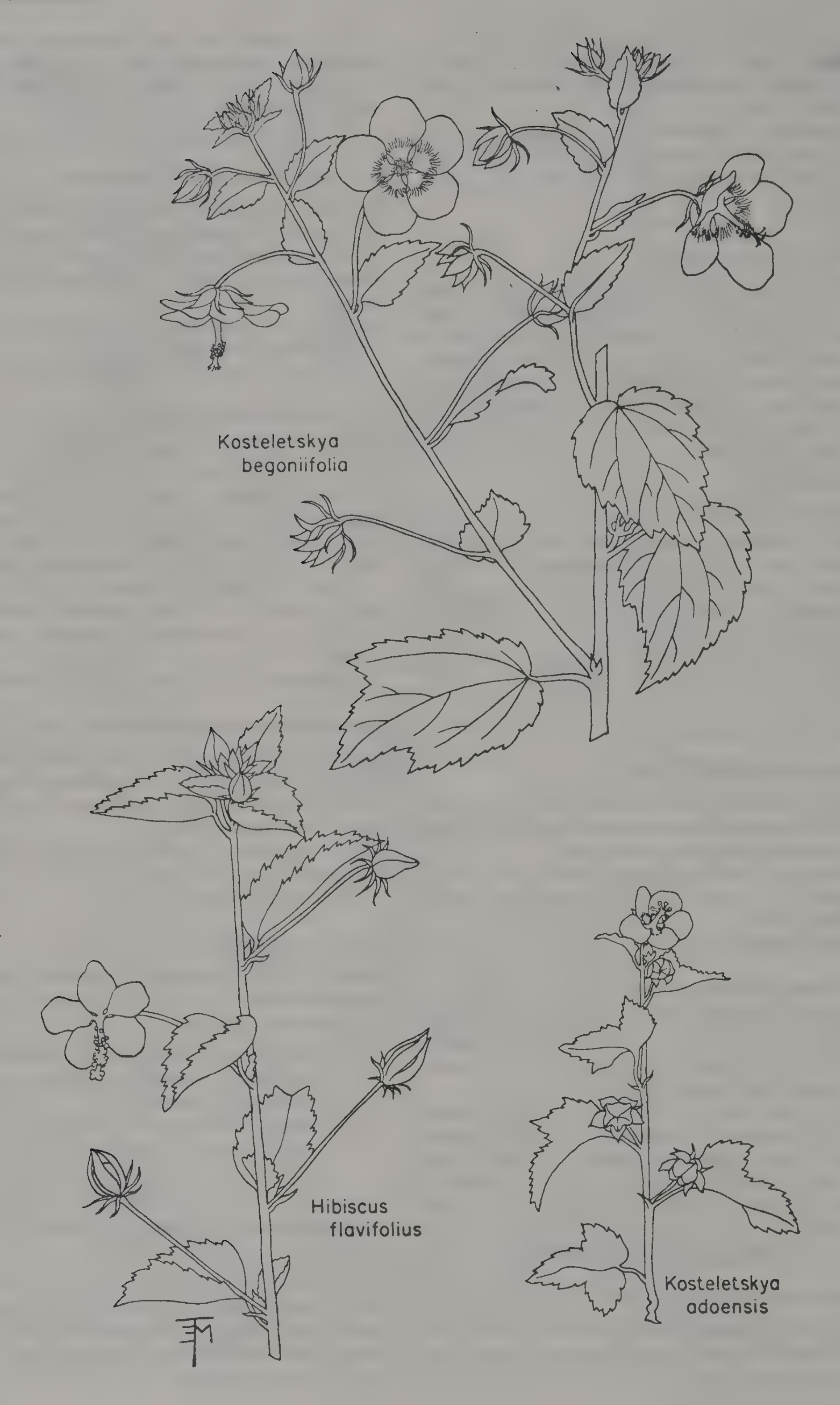
2. KOSTELETZKYA *C. Presl*

Shrubs or herbs similar to *Hibiscus* but with the capsule winged with only one seed per loculus; epicalyx always present.

1 Stem with a line of dense pubescence on the internode, changing position at each node; petals 8–12 mm long — 1. *K. adoensis*
  Stem without a line of dense pubescence on the internode; petals 15–25 mm long — 2. *K. begoniifolia*

1. Kosteletzkya adoensis (*A. Rich.*) *Mast.* (see p. 200)

A perennial herb or low shrub with irritant stellate hairs and a line of dense pubescence on the internodes; leaves pentagonal to suborbicular, cordate; flowers solitary or fascicled; petals pink to purple, darker at base.


Kosteletskya
begoniifolia
Hibiscus
flavifolius
Kosteletskya
adoensis

Locally common at the edge of high forest and where high forest has been cleared, below 8000 ft. HE, HM, HA, HK, MUM, KIT, MAC.

Lind, Napper and Beecher 5509.

2. Kosteletzkya begoniifolia (*Ulbr.*) *Ulbr.* (see p. 200)

Similar to the last species but larger in all parts with irritant hairs and without the thick pubescent line between nodes.

Rare, found in the wetter savannah areas, especially near water. HE, KIT.

Tweedie 67/354.

3. SIDA *L.*

Annual to perennial herbs or low shrubs, with simple serrate leaves; flowers small, white to yellow or orange, solitary or fascicled or in racemes; epicalyx absent; calyx often campanulate; petals 5; staminal tube dilated at the base, giving rise to filaments only at the apex; ovary of 5-many carpels, with a similar number of style branches, each carpel 1-seeded; fruit of dehiscent or indehiscent mericarps.

1 Awns on mericarps overtopping the fruiting calyx, with retrorse barbs — 1. *S. cordifolia*
  Mericarps awnless or awns not exceeding the calyx, never with retrorse barbs — 2
2 Leaves cordate at base — 3
  Leaves rounded to cuneate at base — 5
3 Mericarps 8–12; leaves ± deeply 3-lobed — 2. *S. ternata*
  Mericarps 5; leaves hardly lobed or simple — 4
4 Calyx and leaves pilose; erect woody herb — 3. *S. urens*
  Calyx and leaves sparsely pubescent; a trailing thin-stemmed plant — 4. *S. veronicifolia*
5 Leaves entire except for an apical notch (or apically truncate) often with a small tooth in the centre of the notch — 6
  Leaves serrate, not apically notched nor truncate — 7
6 Leaves concolorous; mericarps smooth without reticulations on the dorsal or lateral faces — 5. *S. cuneifolia*
  Leaves discolorous; mericarps with the dorsal (and often the lateral) faces reticulate — 6. *S.* sp. *A*
7 Pedicels articulated less than 1·5 mm below the flowers — 7. *S. ovata*
  Pedicels articulated more than 2 mm below the flowers — 8
8 Calyx tube with 10 ridges at base; flowers less than 2 cm diameter; pedicels shorter than subtending leaf — 9
  Calyx tube unridged at base; flowers more than 2 cm in diameter; pedicels longer than subtending leaf — 8. *S.* sp. *B*
9 Petioles not more than a quarter the length of the lamina; mericarps thick-walled, indehiscent — 10
  Petioles more than half the length of lamina; mericarps thin-walled at base, dehiscent — 9. *S. alba*
10 Sepals acuminate; mericarps reticulately ornamented on the outside — 10. *S. acuta*
  Sepals triangular; mericarps smooth on the outside — 11. *S. rhombifolia*

1. Sida cordifolia *L.*

Erect woody pilose annual with ovate, cordate or rounded leaves and solitary, or often fascicled pale yellow flowers.

Found as a weed in the warmer parts of Kenya with an adequate rainfall. MUM, MAC.

Kirrika 210.

2. Sida ternata *L. f.* (see p. 202)

A low trailing almost glabrous herb, with ovate-pentagonal, 3–5-lobed leaves and solitary axillary white flowers.

Uncommon plant found in montane rain-forest. Often in the bamboo zone as an adventive in disturbed ground and pathsides. HE, HT, HM, HA, HK, KIT.

Agnew 7162; Nattrass 706.

3. Sida urens *L.*

An erect woody pilose annual with ovate cordate leaves and short axillary racemes of pale orange flowers.

Common in western Kenya, but nowhere else, as a weed of disturbed ground. MUM.

Davidson, July 1959; Agnew and Musumba 8076.

4. Sida veronicifolia *Lam.*

A trailing sparsely pilose herb, with leaves similar to *S. ternata* but suborbicular and hardly lobed, solitary white flowers.

A rare plant only recorded from swampy ground near Kisii. KIS.

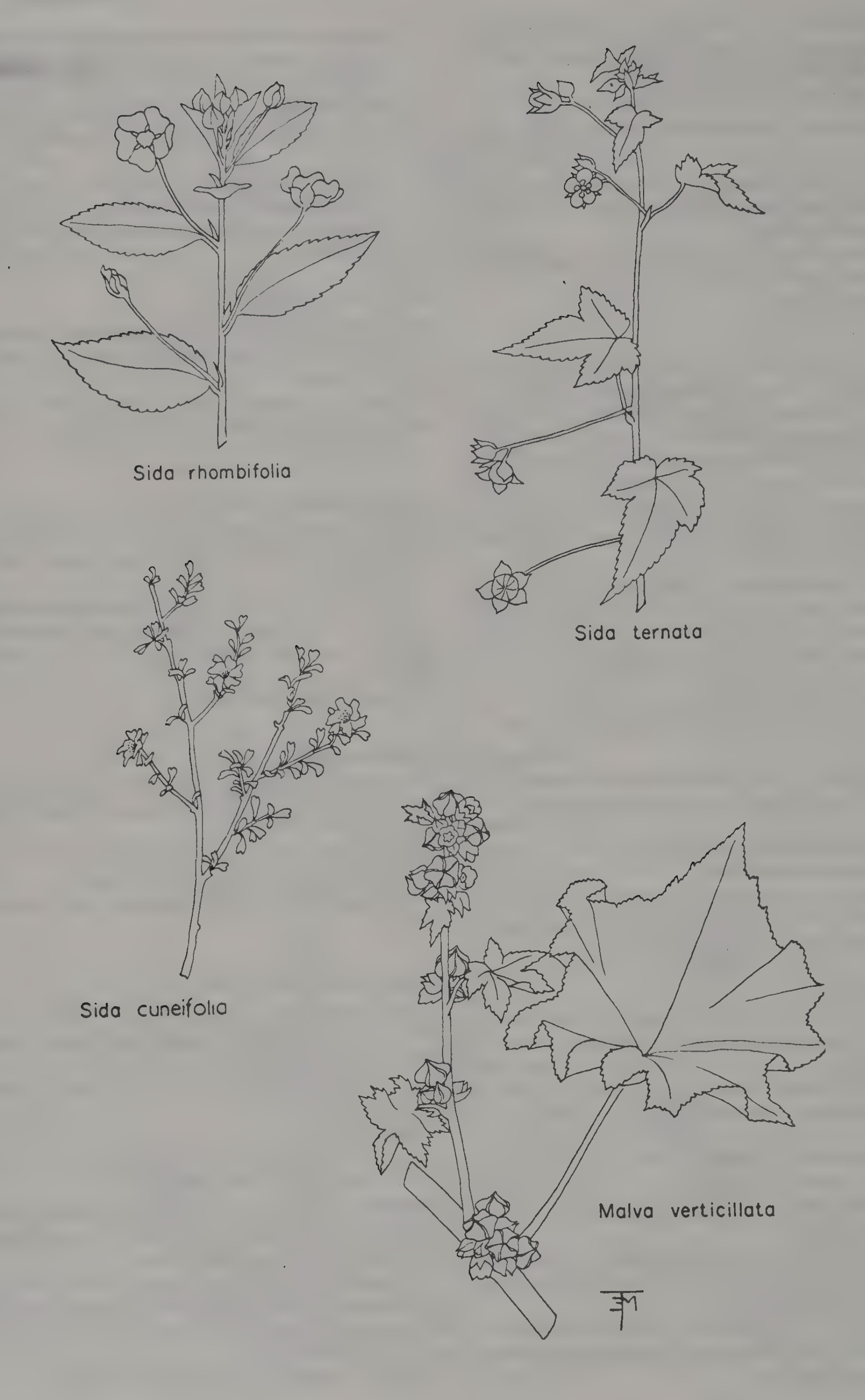
Napier 5271.

5. Sida cuneifolia *Roxb.* (see p. 202)

An erect or spreading shrub with oblanceolate to narrowly-obtriangular to almost linear-oblong leaves and solitary yellow flowers.

Common in the dry grasslands of Kenya, 3000–8000 ft, and forming wiry bushes especially in overgrazed land. HM, KIS, NAR, RV, EMB, MAC, MAG, NBI, KAJ.

Hanid and Kiniaruh 936; Glover 2597.


Sida rhombifolia
Sida ternata
Sida cuneifolia
Malva verticillata

6. Sida *sp.* A.

Very similar to *S. cuneifolia*, but a more tortuously branched plant with smaller leaves and usually densely pubescent on the lower side of the leaves and calyx, sometimes with much broader leaves, and with the fruit characteristics mentioned in the Key.

This species is found in similar situations to *S. cuneifolia* and is apparently as common. HC, KIT, NAR, RV, NAN, MAC, NBI, KAJ.

Hume 72; Agnew and Musumba 5338.

7. Sida ovata *Forsk.*

Densely pubescent, shrubby, short-lived perennial or woody annual with ovate elliptic leaves and solitary, pale orange-yellow flowers.

A common *Sida* in dry grassland areas. HA, HL, MUM, NAR, RV, NAN, MAC, NBI, KAJ.

Agnew and Azavedo 9330.

8. Sida *sp.* B.

Similar to *S. ovata* in all respects except for the following: pedicels usually longer than the leaves, articulated 4-7 mm below the flowers; sepals 8-10 mm long, not ridged at base; petals to 18 mm long, orange-yellow; mericarps awned, with ascending bristles, reticulate on the lower dorsal and lateral faces.

In dry grassland and bushland. MAC, KAJ.

Blencowe 26; Bally 742.

9. Sida alba *L.*

An erect pubescent woody annual, with ovate-elliptic to oblong leaves; flowers often on lateral racemes, or solitary, white or cream.

Uncommon plant found in disturbed places in dry grassland, 3000-6000 ft. MUM, KIS, NAR, BAR, MAC, NBI, KAJ.

Hanid and Kiniaruh 741; Bogdan 4734.

10. Sida acuta *Burm. f.*

Erect, short-lived, sparsely pubescent perennial with short-petiolate, lanceolate-oblong leaves and solitary cream or pale yellow flowers.

Not uncommon amongst cultivation in dry areas at the coast and again in west Kenya. KIS, MUM.

Hanid and Kiniaruh 676; Templer 29.

11. Sida rhombifolia *L.* (see p.202)

Erect, short-lived perennial with ovate-elliptic or rhombic leaves and yellow flowers in axillary racemes (or rarely fasciculate or solitary).

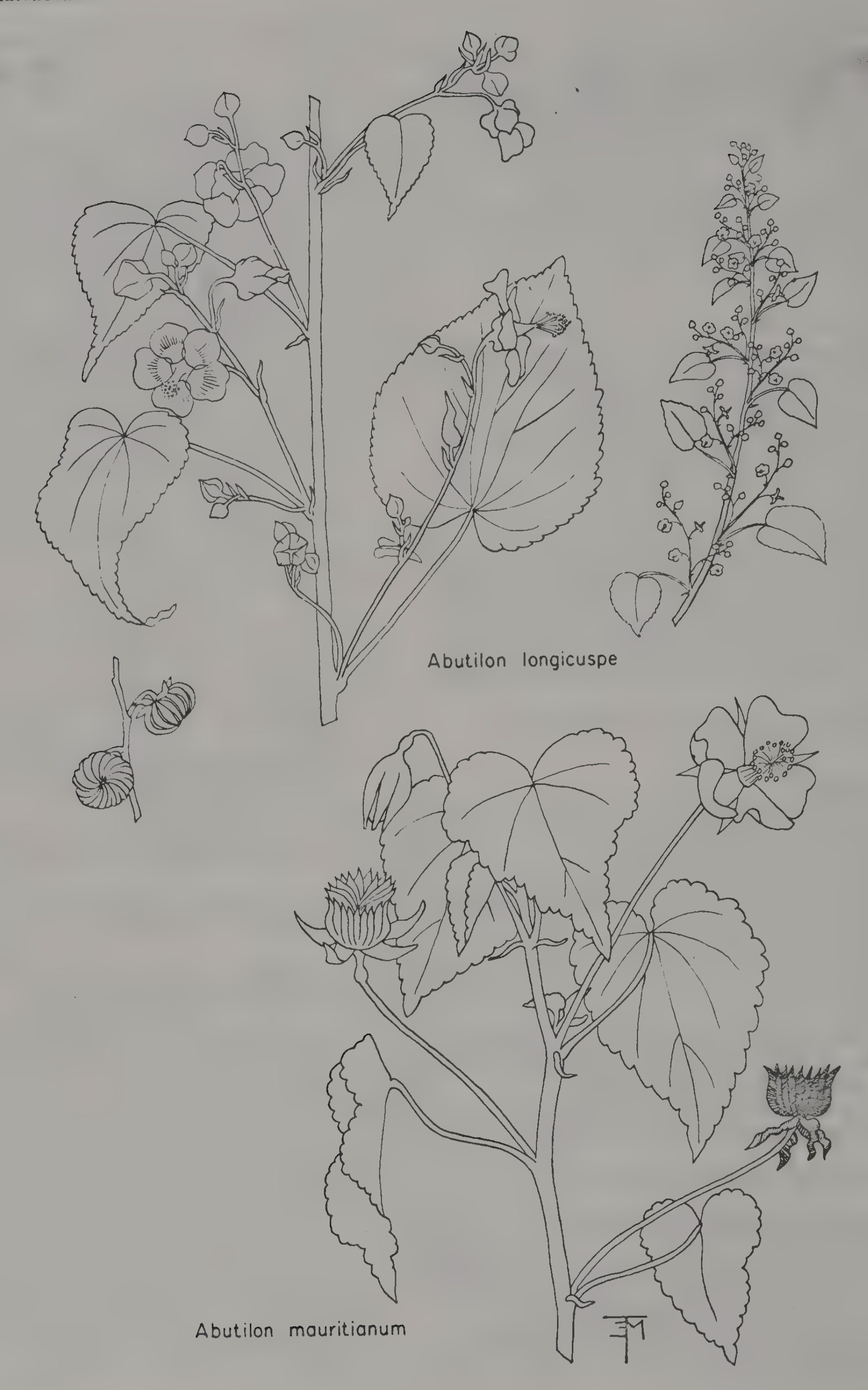
A common *Sida* below 6000 ft, often in places disturbed by man. HE, HC, HL, KIT, MUM, KIS, NAR, EMB, MAC, NBI.

van Someren in EAH 12281; Hanid and Kiniaruh 597.

4. ABUTILON *Mill.*

Herbs or shrubs with usually simple, ovate, cordate, acuminate leaves; flowers in terminal panicles or solitary or fascicled, usually yellow, opening usually mid-afternoon; epicalyx absent; sepals 5, connate at base; petals 5, often asymmetric; staminal tube markedly expanded at base, usually with stamens all crowded at the apex; ovary of 5-40 carpels, each with one style and stigma joined laterally to form a globose gynoecium; fruit of spreading, loosely coherent, 1-3-seeded mericarps; seeds glabrous or hairy.

1 Flowers blue, mauve, or white with purple base, in conical terminal panicles; staminal tube with reflexed simple crystalline hairs — 1. *A. longicuspe*
Flowers yellow or orange, rarely in conical terminal panicles; staminal tube never with simple reflexed hairs — 2
2 Mericarps less than 15, or shorter than 8 mm — 3
Mericarps more than 15, or longer than 8 mm — 5
3 Pedicels 2-4 at apex of axillary peduncles; mericarps usually 8, with awns over 2 mm long — 4. *A. ramosum*
Pedicels solitary, axillary; mericarps usually 10 or more, with awns less than 1 mm long, or unawned — 4
4 Annual plant; corolla more than 15 mm long; mericarps with a narrow awn above — 2. *A.* sp. *A*
Perennial shrub; corolla less than 12 mm long; mericarps acute but not awned above — 3. *A. fruticosum*
5 Leaves bullate above; calyx lobes shorter than the tube; staminal tube glabrous — 6. *A. guineense*
Leaves smooth above; calyx lobes usually longer than the tube; staminal tube stellate-hairy — 6
6 Mericarps rounded or merely obtusely angled on the outside; inflorescence branches often viscid — 5. *A. hirtum*
Mericarps with a long acute point on the outside; inflorescence branches never viscid — 7
7 Both long spreading and short canescent hairs present; stipules filiform, straight — 8. *A. mauritianum*
Indumentum without long spreading hairs; stipules strap-shaped, often curved — 7. *A. grandiflorum*


Abutilon longicuspe
Abutilon mauritianum

1. Abutilon longicuspe *A. Rich.* (see p. 204)

A perennial shrub with densely grey-pubescent stems and leaf undersides, bearing suborbicular cordate leaves; flowers in terminal conical panicles, mauve, lavender, or lilac with a darker centre; mericarps not awned.

A common plant of upland forest edges, 5000–9000 ft. HE, HT, HM, HA, HK, NAR, MAC, NBI.

Lind and Harris 5066; Dyson 456.

2. Abutilon *sp.* **A.**

Erect, densely pubescent, sparsely branched annual with ovate to lanceolate, cordate leaves and solitary yellow flowers; mericarps usually 10, with a short apical awn.

Locally common in dry grassland or bushland. MAG, MAC, KAJ.

Verdcourt 3890; Agnew 9777.

3. Abutilon fruticosum *Guill. & Perr.*

Woody, canescent, usually much-branched shrub, with ovate to suborbicular, shallowly cordate leaves; flowers solitary yellow; mericarps 10–12, with an apiculate angle on the top of the outer face.

A locally common plant of dry *Commiphora* bushland. MUM, BAR, MAG, EMB, KAJ.

Verdcourt 2750; Agnew and Musumba 7961.

4. Abutilon ramosum (*Cav.*) *Guill. & Perr.*

A loose shrub with densely pubescent stems and petioles and glabrescent, suborbicular, cordate leaves; flowers 2–4 on short axillary racemes, yellow; mericarps about 8, each with a 2 mm long awn.

A rare weed found in cultivation in dry country. BAR.

Tweedie 2301.

5. Abutilon hirtum (*Lam.*) *Sweet* (Incl. *A. figarianum* Webb of Check List.)

Erect, densely pubescent, sparsely branched woody herb or shrub with ovate to suborbicular, cordate leaves; flowers grouped on lateral, usually brown viscid-hairy branches or in loose terminal panicles, orange-yellow, with or without a dark red-purple spot at base; mericarps 20 or more, suborbicular, with or without an apiculate angle above.

A very variable plant as defined here, found in disturbed places in drier *Combretum* woodland as well as in dry *Commiphora* country. The sticky, viscid plant may be different from the non-viscid, often smaller-flowered plant, but more field work is required. BAR, MAG, NAN, KAJ.

Agnew 5394; Bogdan 4737.

6. Abutilon guineense (*Schum.*) *Bak. f.*

Similar to *A. mauritianum* except for the strap-shaped stipules and bullate leaves; sepal lobes shorter than the tube; mericarps as in *A. grandiflorum* but sericeous, overtopped by the fruiting sepals.

An uncommon plant found in dry disturbed country. KIT, MUM, KIS, BAR, KAJ.

Verdcourt 3847.

7. Abutilon grandiflorum *G. Don*

Similar to *A. mauritianum* except for the absence of long spreading hairs and the strap-shaped stipules; sepal lobes ± shorter than the tube; mericarps acutely pointed but hardly awned, with the lateral glabrous area rounded at the top, not pointed.

This species is hard to distinguish from *A. mauritianum*, but is found in drier regions. MUM, KAJ.

Verdcourt 2594.

8. Abutilon mauritianum (*Jacq.*) *Medic.* (see p. 204)

A softly woody shrub with short dense pubescence and longer spreading hairs; leaves usually suborbicular, cordate; flowers solitary, yellow-gold; mericarps more than 20, each produced at the top into an acutely tapering awn, tomentose, the lateral glabrous areas pointed at the top.

The commonest species of *Abutilon* in our area, growing in red soils at forest and woodland edges and in disturbed ground. It is widely distributed and also found at the coast. HE, HC, HA, KIT, MUM, NAR, RV, EMB, MAC, NBI, KAJ.

Glover 3406; Harmsen 6430.

5. MALVA *L.*

Herbs, seldom woody, the leaves usually orbicular in outline; flowers racemose, sometimes fascicled; epicalyx present, usually of 3 bracts; sepals 5, connate at base; petals 5, pink, white or blue, seldom yellow; ovary of 9–15 1-ovuled carpels arranged around a central torus; fruit discoid, of mericarps which separate at maturity.

1 Epicalyx bracts oblong-ovate; sepals acute; mericarps scarcely sculptured, with rounded radial edges — 1. *M. verticillata*
Epicalyx bracts linear; sepals rounded-mucronate; mericarps deeply sculptured with raised radial edges — 2. *M. parviflora*

1. Malva verticillata *L.* (see p. 202)

Annual, erect or ascending herb, bearing circular leaves with 5–7 short lobes; flowers fasciulate, axillary; petals exceeding calyx.

An introduced Mediterranean weed of waste land in upland areas. HE, HT, HA, HK, KIT, NAR, RV, NBI.

Agnew 7591; Kokwaro 36.

2. Malva parviflora *L.*

Similar to *M. verticillata* but often with decumbent branches; petals ± equalling calyx.

An introduced weed of cultivation at medium altitudes in the Rift Valley. RV.

Agnew and Azavedo 9313; Bogdan 5713.

6. URENA *L.*

Perennial woody herbs with simple leaves with conspicuous glands on the basal nerves; flowers axillary, solitary or fascicled; epicalyx of 5 lobes, connate at the base and campanulate; calyx 5-lobed; petals pink or mauve; ovary globose, of 5 1-ovuled carpels, each with 2 styles; fruit of 5 mericarps with dorsal glochidiate spines.

1. Urena lobata *L.* (see p. 207)

Erect tomentose herb with orbicular to oblong, simple to shallowly 3–7-lobed leaves; flowers pink; fruit globose.

Common in disturbed ground and cultivation in western Kenya. KIT, MUM, KIS.

Strid 2883.

7. PAVONIA *Cav.*

Shrubs or tough herbs with cordate, lobed or entire leaves; epicalyx present, or 5–6 bracts, often connate at base; petals variable in colour; staminal column (in ours) glabrous with the stamens at the apex; ovary with 5 carpels and 10 stigmas; fruit of 5 1-seeded mericarps, often ornamented or appendaged.

1 Epicalyx bracts filiform, 3–4 times longer than the calyx, forming a delicate 'basket' around the fruit — 2
  Epicalyx bracts usually broad, up to 3 times as long as the calyx, not forming a 'basket' around the fruit — 4
2 Leaves entire — 3
  Leaves palmate — 1. *P. zeylanica*
3 Flowers pink; mericarps unwinged — 2. *P. arabica*
  Flowers white; mericarps winged — 3. *P.* sp. *A*
4 Flowers yellow, sometimes maroon within at base — 5
  Flowers pink or white or purple — 7
5 Epicalyx bracts spreading, often rounded at apex; petals often with maroon spot at base — 4. *P. patens*
  Epicalyx bracts appressed to calyx; petals concolorous — 6
6 Epicalyx bracts linear-filiform; petals turning pink on drying. — 5. *P. propinqua*
  Epicalyx bracts lanceolate; petals not turning pink on drying — 6. *P. elegans*
7 Lower leaves oblong in outline; flowers solitary — 7. *P. kilimandscharica*
  Lower leaves suborbicular in outline; flowers solitary or fascicled — 8. *P. urens*

1. Pavonia zeylanica *Cav.*

Annual or short-lived perennial with viscid and simple hairs on all parts; leaves orbicular, 3–5-lobed; flowers solitary, pale yellow or cream.

A local plant of dry land after rain, found in *Commiphora* bushland. BAR, MAG, MAC.

Harmsen 6471; Bogdan 5130.

2. Pavonia arabica *Boiss.*

Glandular-pubescent annual or short-lived perennial, with ovate, cordate, entire leaves and pink flowers.

Found in dry country on sandy soils, this plant is easily confused with the next. BAR, EMB, MAC.

Edwards 138.

3. Pavonia *sp.* **A.**

Similar to *P. arabica* but smaller and not glandular, it can be further distinguished by its white flowers and winged fruits.

Uncommon plant found in dry country. MAC, KAJ.

Verdcourt 2580.

4. Pavonia patens (*Andr.*) *Chiov.* (see p. 208)

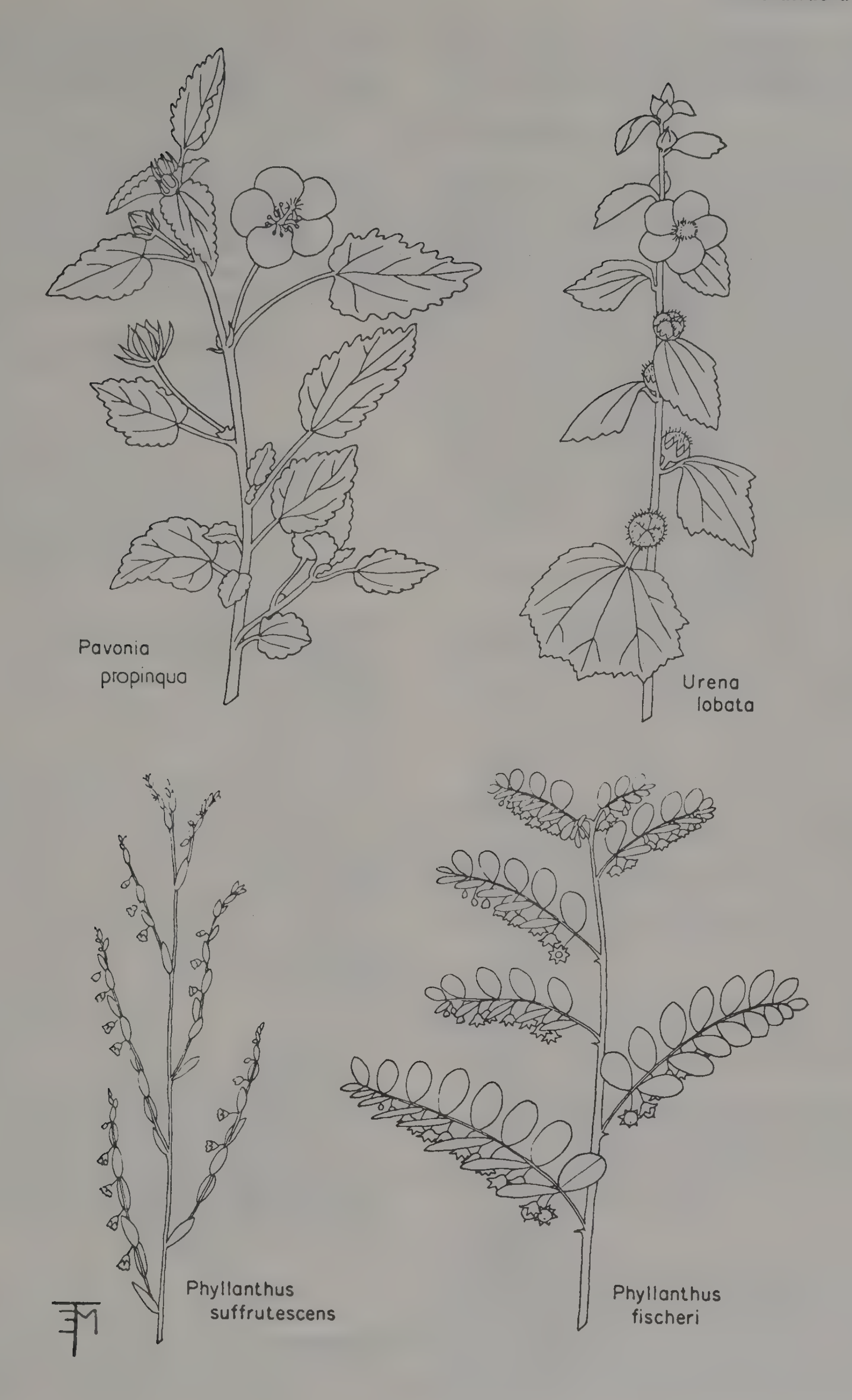
Stellate-pubescent trailing or erect shrub with ovate to orbicular cordate leaves and solitary flowers; petals yellow, with or without a dark spot at base within.

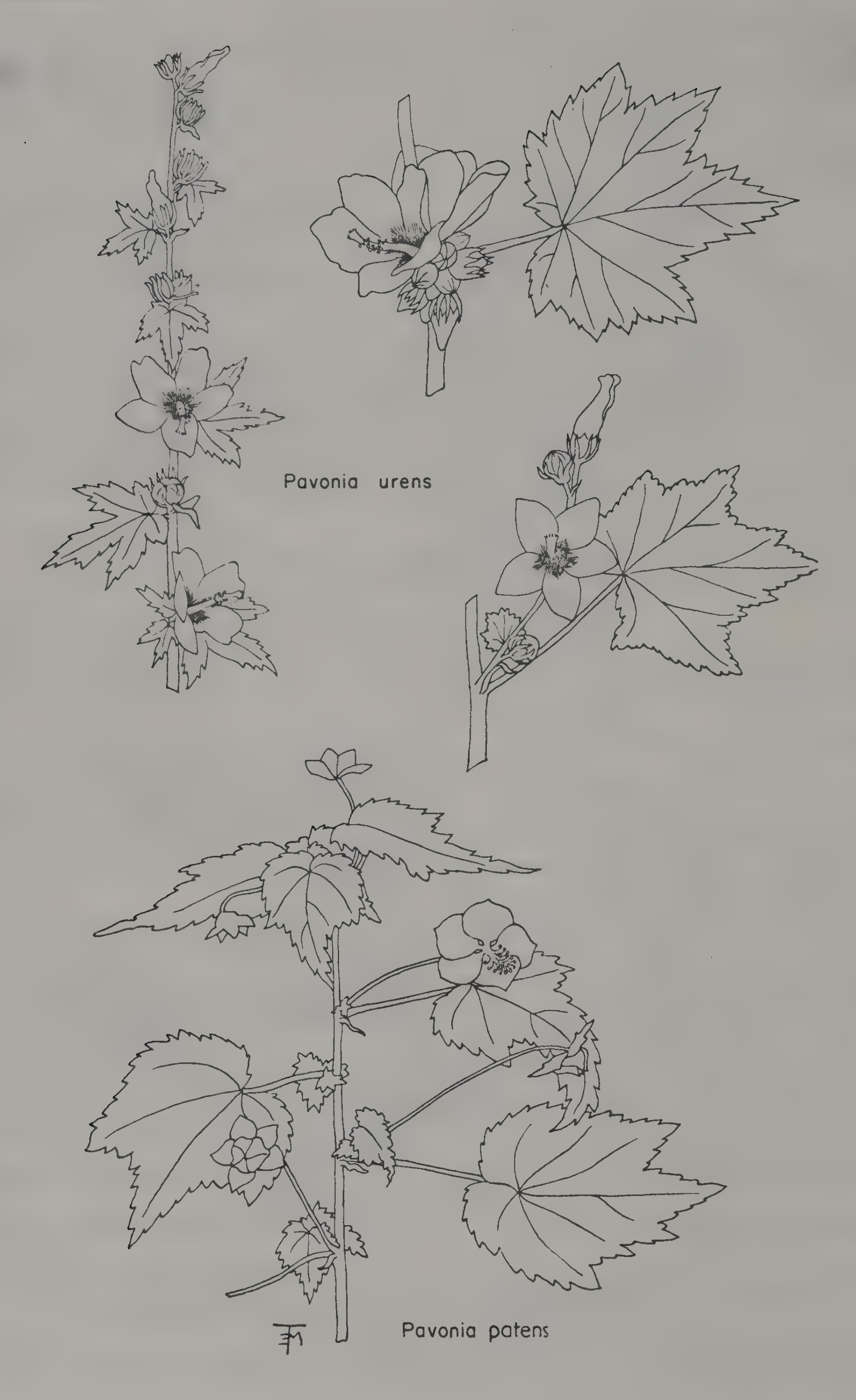
A most variable plant with (as defined here) a wide ecological tolerance, extending from *Commiphora* woodlands (where the form with long narrow acute epicalyx bracts and warty fruit is commonest) to upland wet forest margins (where the common plant has obovate, rounded epicalyx bracts and smooth fruits). More work is needed to settle the status of these forms, and at the moment it seems best to merge them in one. HE, HC, HT, HM, HA, HK, KIT, NAR, BAR, RV, MAG, NAN, MAC, NBI, KAJ.

Agnew and Kiniaruh 8858; Kokwaro 261.

5. Pavonia propinqua *Garcke* (*P. grewioides* Garcke) (see p. 207)

Stellate-pubescent shrub, with oblong or ovate rounded leaves and solitary flowers; petals yellow, usually turning pink with age.


Pavonia propinqua
Urena lobata
Phyllanthus suffrutescens
Phyllanthus fischeri


Pavonia urens
Pavonia patens

Locally common in dry *Commiphora* or *Combretum* country. MAG, MAC, KAJ.

Verdcourt 2584; Lind, Agnew, and Beecher 5710.

6. Pavonia elegans *Boiss.*

Similar to *P. propinqua* except for the leaves of which the lower are suborbicular and to 12 cm diameter and all of which are softly felty, the 6-8 lanceolate epicalyx bracts, the petals which do not fade to pink, and the mericarps which are densely sharp-tuberculate on the dorsal face and without lateral spines.

Locally common in dry country. MAC.

Hanid and Kiniaruh 496; Napper 1576.

7. Pavonia kilimandscharica *Guerke*

Sparsely pubescent shrub with oblong or elliptic leaves and solitary flowers; petals white to mauve, with purple spots within at base.

An uncommon plant found in forest edges, 6000-9000 ft. HM, HK, NAR, KAJ.

Honore 3048.

8. Pavonia urens *Cav.* (including *P. irakuensis* Ulbr. of Check List) (see p. 208)

Soft shrub, usually hairy, with suborbicular 5-7-triangular-lobed leaves; flowers clustered or solitary, on short pedicels; petals pink, mauve or white.

A highly variable species, as delimited here, which grows in upland forest edges and riverine communities in the drier regions above 5000 ft. A highland western Kenya type is densely golden-hairy, with dense clusters of almost sessile flowers, whilst a riverine-forest ecotype has solitary white flowers and is almost glabrous. There seem to be intermediates between all these types. HE, HC, HT, HM, HL, HA, HK, KIT, MUM, KIS, NAR, EMB, MAC, NBI, KAJ.

Baker 45; Harmsen 6527.

8. WISSADULA *Medic.*

Erect shrubs with mostly cordate, acuminate, entire leaves; flowers in panicles; epicalyx 0; petals orange to cream; ovary of 3-5 free carpels, each 2-3-ovulate with 3-5 style branches and capitate stigmas; fruit of 3-5 free beaked pubescent mericarps, each transversely divided and septicidal, eventually falling from the torus; seeds 1-3 per mericarp.

Wissadula rostrata (*Schumach.*) *Hook. f.*

A loose shrub with a cluster of ± unbranched stems bearing ovate-orbicular cordate leaves; flowers in loose axillary panicles, orange.

A rare plant of western Kenya, only found once amongst granite boulders in bushland. MUM.

Agnew, Musumba, and Kiniaruh 8087.

52. MALPIGHIACEAE

Woody climbers or small shrubs in ours, with unicellular appressed medifixed hairs; leaves opposite in ours, simple and entire, stipulate or exstipulate, with a pair of glands at the base of lamina or on petiole; inflorescences terminal or axillary corymbose racemes, sometimes paniculate; bracts and bracteoles present; flowers regular and bisexual in ours; sepals 5, free or connate at base, often biglandular outside; petals 5, frequently clawed, free, imbricate; stamens 10, filaments often connate at base; ovary superior, syncarpous, mostly 3-celled and 3-lobed, with a single axile ovule in each cell; styles as carpel number, separate, persistent; fruiting carpels winged in ours; seeds without endosperm, mostly with straight embryo.

1 Sepals closed over petals in bud
 1. *Flabellaria paniculata*
 Sepals open in bud, petals visible 2
2 Leaves ovate-cordate; ovary densely sericeous
 3. *Caucanthus auriculatus*
 Leaves elliptic to ovate, with rounded or cuneate base; ovary glabrous 2. *Triaspis*

1. FLABELLARIA *Cavan.*

Woody climbers with exstipulate leaves and terminal or axillary paniculate racemes; sepals closed over petals in bud, eglandular; petals entire, not clawed; lateral wings of samara connate at base and free at top.

A monospecific genus of tropical Africa.

Flabellaria paniculata *Cavan.*

A silky-tomentose to glabrescent woody climber with broadly elliptic to ovate leaves and leafy many-flowered inflorescences; petals white to light pink.

A rare plant of rain-forests, often riparian, and recorded only from Kakamega forest in our area. It is much in need of further collection with careful field notes. MUM.

Verdcourt in EAH 11554.

2. TRIASPIS *Burch.*

Erect, scandent or semiscandent, small shrubs with petiolate leaves in ours; leaf-lamina with 2-4 glands on under surface near the insertion of the petiole; inflorescences of terminal corymbs in ours; bracts and bracteoles deciduous; sepals without glands; petals with fringed or denticulate

margins; pedicels articulated with the peduncles; wing of samara retuse at apex in ours.

1 Wings of fruit entire or slightly retuse at apex; leaves with ± prominent lateral nerves on lower surface 1. *T. erlangeri*
Wings of fruit distinctly retuse at apex; leaves with indistinct lateral nerves 2. *T. niedenzuiana*

1. Triaspis erlangeri *Engl.*

Canescent to glabrescent, much-branched, small, erect shrub with tips of branchlets twining and elliptic to ovate leaves; inflorescences terminal, loosely corymbose, of white to pinkish flowers.

A rare plant found in dry bush country, recorded only from Kitui District in our area. It is much in need of further collection. MAC.

Edwards 151.

2. Triaspis niedenzuiana *Engl.*

A short-pilose to glabrescent, much branched semi-erect or scandent small shrub with broadly elliptic leaves and terminal inflorescences of loose corymbs of white to lilac or pink flowers.

A rare plant found in dry bush country, sometimes on rocky outcrops or stony hillsides, and recorded in our area only from Kitui District. More material with careful field notes needed. MAC.

Edwards 54; Lind and Agnew 5653.

3. CAUCANTHUS *Forsk.*

Climbers with stipulate leaves bearing 2 large glands near the base; stipules very small, deciduous; sepals without glands; petals with wholly or partially fimbriate margins; each carpel of fruit completely surrounded by a wing.

Caucanthus auriculatus (*Radlk.*) *Niedenzu*

A pubescent or glabrescent climbing and twining shrub with ovate-cordate leaves and axillary and terminal corymbs of pale yellow evil-smelling flowers.

A plant of dry bush country, woodlands, and upland dry evergreen forests; often riparian or in rocky places. BAR, MAC, NBI, KAJ.

Bogdan 4236; Lind and Agnew 5695.

53. EUPHORBIACEAE

Plants of every habit, with alternate or opposite, usually stipulate, usually simple leaves; flowers unisexual, monoecious or dioecious, regular, basically pentamerous but often irregular in numbers of parts; calyx rarely absent, often valvate; petals present, free or absent; glandular disc often present, sometimes variously lobed; male flowers with 5-numerous stamens, free or often fused in a central column, and with or without a rudimentary ovary; female flowers with no staminodes, and usually with a 3-carpelled ovary with 1–2 axile ovules per loculus and dichotomous or divided stigmas; fruit usually a capsule or schizocarpic; seeds with aril and endosperm.

An abundant and important family, with small 'difficult' flowers. In the following account two pairs of genera are so similar (*Phyllanthus* and *Meineckia*, *Tragia* and *Tragiella*) that they are keyed out together.

1 Apparent flower (a cyathium) of stamens and ovary surrounded by a glandular cup; plants with milky latex 2
Flowers separate, unisexual; plants without latex 3
2 Cyathia regular; involucral glands separate all round the involucre, or gland single, lateral 11. *Euphorbia*
Cyathia zygomorphic; gland continuous in a circle round the involucre except for a gap at one side through which the ovary is exserted 12. *Monadenium*
3 Leaves palmatifid or palmatisect 4
Leaves simple 6
4 Twining climber with inflorescence held within a pair of light-coloured, 3-pointed bracts 8. *Dalechampia ipomoeifolia*
Erect shrubs or herbs 5
5 Flowers in a terminal panicle; male flowers with branched filaments; fruits usually softly spiny 7. *Ricinus communis*
Flowers in axillary or terminal cymes; male flowers with simple filaments; fruit smooth 9. *Jatropha*
6 Leaves entire 7
Leaves serrate, dentate or sinuate 8
7 Leaves turning red or orange before falling 10. *Clutia*
Leaves falling while still green 1. *Phyllanthus* (and 2. *Meineckia*)
8 Inflorescence of spikes or racemes of solitary or clustered flowers 9
Inflorescence of dichasial cymes 9. *Jatropha*
9 Raceme very interrupted, with clusters of male and female flowers together along its length 3. *Micrococca*
Raceme or spike with male flowers above, and female at base, or plants dioecious; male part of spike or raceme interrupted or not 10
10 Female flower with enlarging calyx in fruit; stinging hairs frequently present 5. *Tragia* (and 6. *Tragiella*)
Female flower with enlarging bract and inconspicuous sepals in fruit; stinging hairs never present 4. *Acalypha*

1. PHYLLANTHUS *L.*

Monoecious or dioecious shrubs or herbs, often with simple stipulate leaves on specialised branches of limited growth; flowers solitary or fasciculate with 4-6 sepals and an expanded disc; male flowers with 2-5 free or variously connate stamens; female flowers with an ovary with usually bifid or laciniate stigmas; fruit a berry or dry capsule with two seeds per loculus.

A common genus which includes a number of woody shrubs or trees which are described in KTS. Here all species are dealt with, not only because some of the woody species are often so low as to appear suffrutescent, but also because changes have been made to the names recorded in KTS.

1 Plants with specialized leafy branches of limited growth, and with only scale-leaves on main stem — 4
Plants with leaves on main stem as well as on branches, the latter unlimited in growth, unspecialized — 2
2 Trees over 2 m in height — 6. *Ph. discoideus*
Shrubs or herbs under 1 m in height — 3
3 Leaves with a pale central blotch, acute, cuneate, or apiculate at apex — *Meineckia phyllanthoides*
Leaves with no pale central blotch, rounded at apex — *Meineckia* sp. *A*
4 Sepals 4 or 5, occasionally a few flowers with 6 sepals — 5
Sepals 6, occasionally a few flowers with 5 sepals — 12
5 Annual, erect herbs — 6
Perennials — 7
6 Ovary warty — 1. *Ph. leucocalyx*
Ovary smooth — 2. *Ph. amarus*
7 Plant low, creeping — 3. *Ph.* sp. *A*
Plant erect — 8
8 Pedicels over 8 mm long, often longer than their subtending leaves — 4. *Ph. capillaris*
Pedicels less than 8 mm long, always shorter than their subtending leaves — 9
9 Leaves oblong, less than 1 cm broad; stigmas entire or almost so — 5. *Ph. guineensis*
Leaves elliptic, always some over 1 cm broad; stigmas deeply bifid — 10
10 Leafy branches longer than 15 cm; fruits inflated, over 2 cm diameter — 7. *Ph. inflatus*
Leafy branches seldom over 10 cm long; fruit not inflated, to 5 mm diameter — 11
11 Stamens 4-5 all free — 8. *Ph. muellerianus*
Stamens 1-2 free, and 3 fused to a central column — 9. *Ph. reticulatus*
12 Pedicels 5 mm or more long — 13
Pedicels less than 5 mm long — 14
13 Leaves ovate; pedicels to 6·5 mm long — 10. *Ph. glaucophyllus*
Leaves elliptic; pedicel 7-14 mm long — 11. *Ph.* sp. *B*
14 Upper leaves four times as long as broad; sepals obovate, with the hyaline margin narrow or absent — 12. *Ph. maderaspatensis*
Upper leaves up to three times as long as broad; sepals ovate or oblong, usually with a broad hyaline margin — 15
15 Outer sepals sub-orbicular, cordate at base; style fused in a central column — 13. *Ph.* sp. *C*
Outer sepals ovate to oblong, not cordate at base; styles free — 16
16 Leaves mostly oblong, some at least parallel-sided, rounded at base and apex, apiculate; sepals elliptic with a narrow midrib and broad hyaline margin — 14. *Ph. odontadenius*
Leaves elliptic or obovate, rarely apiculate; sepals often with a broad midrib — 17
17 Sepals with a broad white hyaline margin, as wide as or wider than the herbaceous central portion — 20
Sepals with a hyaline margin narrower than the herbaceous central portion, or margin yellow or green, merging into the central portion — 18
18 Erect shrubs usually over 50 cm tall; leaves elliptic or obovate, over 5 mm wide — 19
Erect spreading woody herbs, less than 50 cm tall; leaves elliptic, less than 5 mm wide — 15. *Ph. suffrutescens*
19 Monoecious plant; sepals (especially of female flower) with yellow margins; fruit with a smooth outer wall — 16. *Ph. fischeri*
Dioecious plant; sepals with pale green margins; fruit with a reticulate pattern outside when dry — 17. *Ph. sepialis*
20 Leaves elliptic, less than 5 mm wide; dioecious plants — 15. *Ph. suffrutescens*
Leaves oblong or obovate, often more than 5 mm wide; monoecious plants — 21
21 Leaves suborbicular to obovate, rounded at apex, sometimes minutely apiculate — 18. *Ph. rotundifolius*
Leaves oblong, occasionally obovate, broadly cuneate at apex, often apiculate — 14. *Ph. odontadenius*

1. Phyllanthus leucocalyx (*Muell. Arg.*) *Hutch.*

An erect monoecious annual to 40 cm with elliptic acute leaves.

Rare plant found in western Kenya and at the coast. HA, MUM.

Graham H91/44; Agnew 10124.

2. Phyllanthus amarus *Schum. & Thonn.*

An erect, monoecious annual to 30 cm with oblong rounded leaves.

Uncommon plant found in marshes at the coast and in the west of our area. KIT.

Bally B 4828; Strid 3159.

3. Phyllanthus *sp.* **A.**

A low creeping monoecious perennial with red stems and obovate leaves.

Common on the Aberdares moorlands, 9000–10 750 ft. HA.

Agnew 8131; Verdcourt 4001.

4. Phyllanthus capillaris *Schum. & Thonn.*

An erect, tomentose or glabrous, monoecious or dioecious many-stemmed shrub to 2 m tall with suborbicular to broad-elliptic leaves.

Locally common in dry savannah woodland country, 6000–8000 ft. HE, HC, KIT, MUM, KAJ.

Agnew 9819; Napier 1997.

5. Phyllanthus guineensis *Pax*

A many-stemmed, erect, monoecious shrub to 3 m, with strictly oblong leaves and pinkish flowers.

Common at the edges of upland forest, 4500–6000 ft, and at the coast. HA, MUM, KIS, BAR, EMB, MAC, NBI.

Agnew and Faden 9977; Kerfoot 2164.

6. Phyllanthus discoideus *Pax*

A tree to 15 m tall, dioecious and without specially developed lateral leafy branches.

This species grows in upland woodland, 4000–6000 ft, and at the coast. HA, MUM, EMB, NBI.

Agnew 7784; Graham 1.

7. Phyllanthus inflatus *Hutch.*

A many-stemmed shrub or bushy tree to 10 m tall, with fascicled inflorescences and inflated fruits.

In wet upland forest. HN, KIS.

Polhill and Verdcourt 274.

8. Phyllanthus muellerianus (*Kuntze*) *Excell*

A tree or shrub to 3 m, with elliptic leaves; flowers monoecious, the males with 5 free stamens.

Only once recorded from our area, at Kakamega Forest, otherwise it is to be found at the coast. MUM.

Paulo 555.

9. Phyllanthus reticulatus *Poir.*

A monoecious shrub to 2 m, with elliptic to obovate leaves; male flowers with 5 stamens, 2 free and 3 connate.

Found in forest edges at the coast and only once recorded (at Bunyala) from our area. MUM.

Makin 323.

10. Phyllanthus glaucophyllus *Sond.*

A low, shrubby, tufted, monoecious shrub to 40 cm tall, with glaucous, glabrous, cordate leaves.

Rare plant found in dry country. KIS, EMB, MAC, KAJ.

Hanid and Kiniaruh 825A; Bally 860.

11. Phyllanthus *sp.* **B.**

A shrub to 3 m, monoecious, with elliptic leaves and long-pedicelled flowers.

Only recorded from Fourteen Falls, on the Athi River. MAC.

Verdcourt 2608.

12. Phyllanthus maderaspatensis *L.*

A tufted monoecious woody annual or perennial to 40 cm with narrow elliptic to linear upper leaves and almost spathulate sepals to the female flowers.

It is the commonest *Phyllanthus* of grassland in dry country. HL, NAR, RV, MAG, EMB, MAC, NBI, KAJ.

Glover and Samuel 3168; Agnew and Hanid 7446.

13. Phyllanthus *sp.* **C.**

An erect monoecious annual or short-lived perennial to 30 cm, with suborbicular to elliptic leaves and cordate sepals.

In dry, sandy bushland. KAJ.

Agnew 9869A; Verdcourt 3862.

14. Phyllanthus odontadenius *Muell. Arg.*

An erect monoecious annual or short-lived perennial to 75 cm with oblong or obovate, apiculate or broadly cuneate leaves.

Common in open woodland grassland especially around Nairobi. HA, KIT, MUM, EMB, MAC, NBI.

Faden 67265; Agnew and Hanid 8376.

15. Phyllanthus suffrutescens *Pax* (see p. 207)

An erect, caespitose or much-branched, dioecious shrub to 40 cm with elliptic leaves and usually purple-nerved sepals.

Locally common in medium rainfall grassland, 3400–7000 ft. Plants from western Kenya usually have larger flowers than those from east of the Rift Valley, and since these two populations appear to be isolated from one another, they may be distinct enough to deserve separate names. HC, HT, KIT, MAC, NBI, KAJ.

Agnew 9223; Thorold 3252.

16. Phyllanthus fischeri *Pax* (see p. 207)

A monoecious shrub with erect or flexuous branches to 2 m (usually less), and elliptic leaves; sepals of the female flowers often yellowish.

Locally common at forest edges, 5000–8500 ft. HE, HT, HM, HA, HK, HN, KIT, RV, ENB, MAC, NBI.

Agnew 8779; Verdcourt 393.

17. Phyllanthus sepialis *Muell. Arg.* (*P. meruensis* of Check List)

An erect, many-stemmed, dioecious shrub to 3 m tall, with broad-elliptic leaves and wrinkled fruits.

Common in forest edges and riverine formations, 3000–8000 ft. MUM, NAR, BAR, RV, MAC, NBI, KAJ.

Bogdan 5243; Agnew 8833.

18. Phyllanthus rotundifolius *Willd.*

An erect branched annual or short-lived monoecious perennial, with obovate to suborbicular leaves and tiny flowers.

Common in dry country, especially grassland. KIS, NAR, RV, MAG, MAC, KAJ.

Hanid and Kiniaruh 825; Verdcourt 3174.

2. MEINECKIA *Baill.*

Monoecious herbs or shrubs with entire stipulate leaves; flowers fasciculate, with 5 sepals, 5 petals and a well-developed disc; male flowers with 5 stamens fused round a column which terminates in a rudimentary ovary; female flowers as in *Phyllanthus.*

1 Leaves with a pale central blotch, acute, cuneate or apiculate at apex 1. *M. phyllanthoides*
  Leaves with no pale central blotch, rounded at apex 2. *M.* sp. *A*

1. Meineckia phyllanthoides *Baill.* (*Cluytiandra capillariformis* (Pax) Pax & Hoffm.)

An erect woody herb or low shrub to 50 cm with white-blotched leaves and long-pedicellate flowers.

Locally common, especially around Nairobi in open woodland, often beside rivers. MAC, NBI.

Agnew 7577; Greenway 8781.

2. Meineckia *sp.* **A.**

An erect monoecious annual to 50 cm with a pale-fissured bark and suborbicular leaves.

Rare plant found in dry, stony bushland. MAG, KAJ.

Agnew 9791; Glover 2957.

3. MICROCOCCA *Benth.*

Monoecious or dioecious herbs or shrubs with simple, serrate, stipulate leaves; inflorescences axillary, of long filiform interrupted racemes of glomeruli; male flowers with 3 valvate sepals, 3–20 free stamens and no sterile ovary; stamens often mixed with glands, the 2 anthers dehiscing longitudinally; female flowers with 3–4 sepals, 2–4-lobed disc equalling the calyx, and a 3-celled ovary; capsule or 3 chambers, each 1-seeded, opening loculicidally and septicidally and with hard, brittle valves and central column; seeds enclosed in a thin aril.

1 Shrub to 3 m tall in wet forests 1. *M. holstii*
  Annual herb to 50 cm tall in dry bushland 2. *M. mercurialis*

1. Micrococca holstii (*Pax*) *Prain*

Dealt with in KTS p. 210. HA.

2. Micrococca mercurialis *Benth.*

A monoecious, glabrous to tomentose annual herb to 50 cm tall with lanceolate, cuneate leaves.

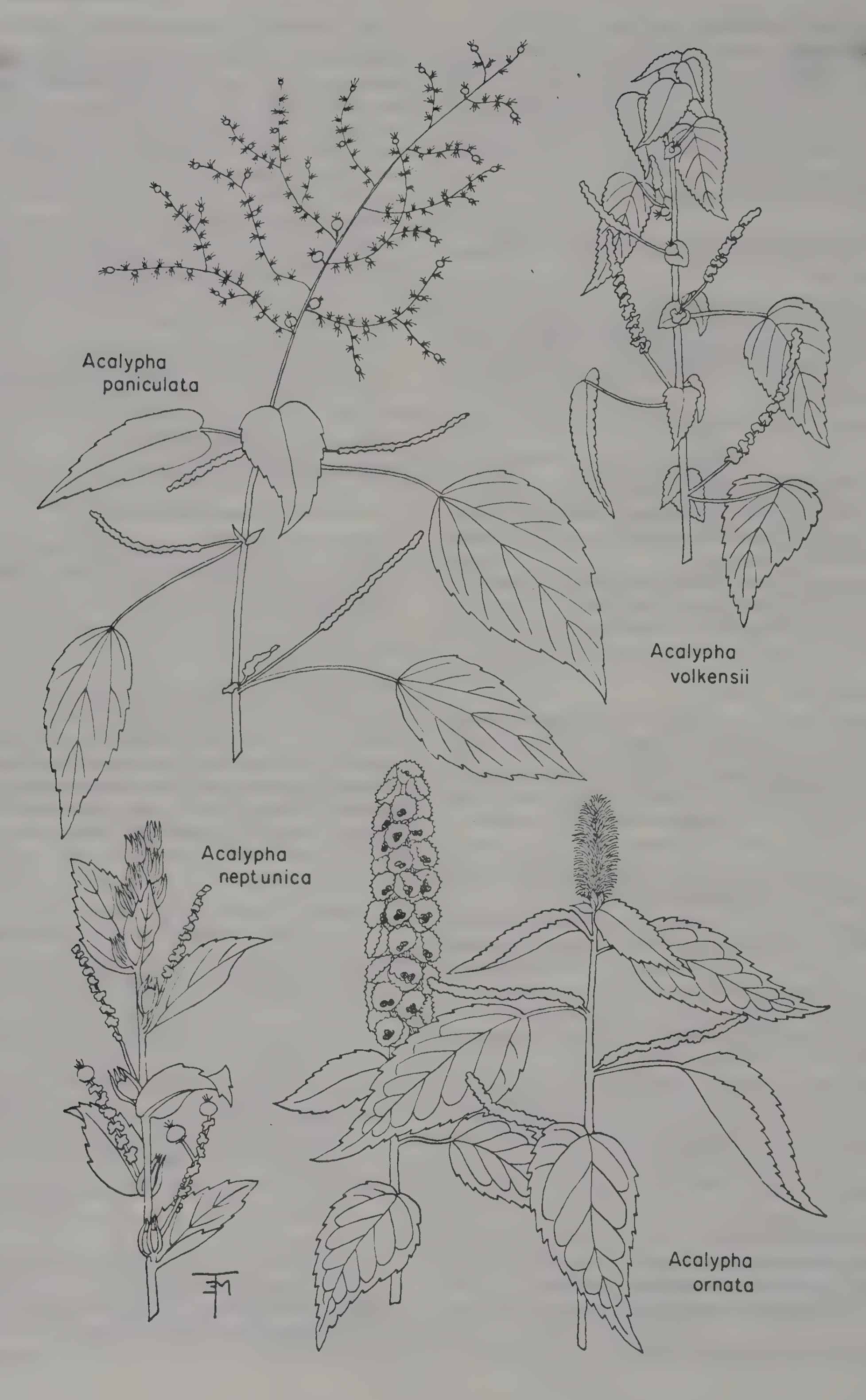
Rare plant found in dry country. BAR.

Bogdan 3847.

4. ACALYPHA *L.*

Dioecious or monoecious shrubs or herbs with simple, serrate leaves; inflorescences paniculate or spicate, often axillary, sometimes terminal; male flowers of 4 valvate sepals and usually 8 stamens, enclosed in bud, often fasciculate along catkinate racemes; female flowers surrounded by an often enlarged bract, 1–2 together, with 3–4 imbricate sepals; ovary with one ovule per loculus and filiform stigmas.

1 Female flowers axillary, sessile, at the base of the male raceme or found along the raceme 2
  Female flowers in terminal spikes, separate from the male raceme 12
2 Female flowers on 1–3·5 cm long peduncles, 2 together, surrounded by a bract almost completely divided into two flat, semi-orbicular lobes 1. *A. bipartita*
  Female flowers sessile or if pedunculate the bract tubular, reniform or orbicular, not as above 3
3 Bracts of female flower deeply palmately divided to half way or more into oblong lobes 4
  Bracts of female flowers laciniate to crenate or entire, not palmatifid 5
4 Erect herb from perennial rootstock; leaves subsessile, rounded at base 2. *A. stuhlmannii*


Acalypha paniculata
Acalypha volkensii
Acalypha neptunica
Acalypha ornata

Erect herb, generally annual; leaves long-petiolate, cordate at base — 3. *A. psilostachya*

5 Annuals — 6
Perennial shrubs — 9

6 Bracts of female flowers fringed at the margin — 4. *A. ciliata*
Bracts of female flowers entire or crenate — 7

7 Bracts of female flowers with long glandular hairs; leaf base cuneate — 6. *A. lanceolata*
Bracts of female flowers with eglandular hairs or glabrous; leaf base rounded — 8

8 Female bracts 3–5 mm long; male glomerules intermixed with uppermost female bracts and extending at most up to 4 mm beyond them — 7. *A. crenata*
At least some female bracts over 5 mm long; male glomerules not intermixed with uppermost female bracts and extending more than 5 mm beyond them — 5. *A. indica*

9 Male racemes pedunculate; female flowers solitary axillary — 8. *A. volkensii*
Male racemes bearing glomeruli to base; female flowers on base of raceme — 10

10 Undersurface of leaves with sessile, yellow, translucent resinous dots — 9. *A. fruticosa*
Undersurface of leaves without resinous dots — 11

11 Leaves ovate, widest below the middle; male racemes less than 5 cm long — 10. *A* sp. *A*
Leaves obovate to oblanceolate to oblong, widest above the middle; male racemes usually over 5 cm long — 12. *A. neptunica*

12 Female inflorescence paniculate — 13. *A. racemosa*
Female inflorescence a spike — 13

13 Female spike long cylindrical, seldom more than 7·5 mm diameter including the stigmas at anthesis, enlarging to nearly 2 cm diameter in fruit — 14. *A. ornata*
Female spike globose or short cylindrical, seldom less than 1 cm diameter including the stigmas at anthesis, hardly wider than 1·5 cm in fruit — 11. *A. villicaulis*

1. Acalypha bipartita *Muell. Arg.*

A trailing shrub with the semiorbicular female glomerules on peduncles 2–3 cm long.

Rare, known only from one gathering from Kombewa, near Kisumu. MUM.

Agnew 8086.

2. Acalypha stuhlmannii *Pax*

A perennial monoecious herb with erect unbranched stems from a woody rootstock.

Common in savannah country in the north-west of our area. HE, HC, KIT.

Tweedie 66/29; Napier 1975.

3. Acalypha psilostachya *A. Rich.* (*A. brachystachya* of Check List)

As defined here this is a most variable plant, including single-stemmed, glandular-pubescent annuals of roadsides and wet savannah, as well as robust soft eglandular herbs of wet forest. HC, HM, HK, KIT, MUM, KIS, KAJ.

Agnew 8780 and 7898; Bally 291.

4. Acalypha ciliata *Forsk.*

Erect unbranched annual with short dense spikes.

Occasional in dry country especially in eastern Kenya. MUM, NAN, MAC, KAJ.

Agnew 9854; Kirrika 11.

5. Acalypha indica *L.*

An erect annual with long inflorescences.

Abundant in dry country on rocky soils. KIS, MAG, MAC, KAJ.

Hanid and Kiniaruh 736; Glover 2811.

6. Acalypha lanceolata *Willd.* (*A. glomerata* Hutch.)

An erect annual usually smaller than *A. indica*.

Found at the coast and also occasionally inland. Rare in our area. MUM, NBI.

Napier 3422A; Agnew 9774.

7. Acalypha crenata *A. Rich.*

Similar to *A. glomerata* in habit but eglandular, or with very few glandular hairs.

Common around Nairobi in the National Park, rare elsewhere. MUM, EMB, NBI, KAJ.

Kokwaro 206.

8. Acalypha volkensii *Pax* (see p. 214)

A loose trailing shrub with red racemes of glabrous male flowers.

Found in upland grassland throughout our area. HE, HC, HA, KIT, MUM, NAR, MAC, NBI, KAJ.

Makin 4300; Agnew and Hanid 8378.

9. Acalypha fruticosa *Forsk.*

An erect, stiff shrub to 1·5 m, smelling resinous when rubbed due to the glandular deposits on all parts.

Common in dry country. MUM, KIS, BAR, MAG, MAC, KAJ.

Agnew 9886; Bally 9037.

10. Acalypha *sp.* A.

An erect shrub very similar to *A. fruticosa* except for the obscure glands and the more prominent tertiary leaf-veins.

Common in dry country and often riverine. MUM, BAR, MAG, NAN, MAC, KAJ.
Agnew and Hanid 7530; Ibrahim 660.

11. Acalypha villicaulis *A. Rich.* (*A. senensis* of Check List)

Soft herb or weak shrub to 1 m with a pair of glands at the top of the petiole below the lanceolate lamina.
Uncommon plant found in warmer areas. MUM, KIS, KIT, EMB, MAC, NBI, KAJ.
Hanid and Kiniaruh 806; Dyson 455.

12. Acalypha neptunica *Muell. Arg.* (*A. subsessilis* in Check List) (see p. 214)

Robust shrub to 3 m with stiff, keeled stipules and stiff leaves.
It is an uncommon plant found in lowland wet forest and lowland gallery forest. HM, MUM, MAC.
Tweedie 67/116; Faden 66193.

13. Acalypha racemosa *Baill.* (*A. panicultata* Miq) (see p. 214)

A woody shrub or occasionally a soft herb, with terminal panicles of female flowers.
Locally common in upland forest edges, 5000-7000 ft, especially around Nairobi. HA, HK, EMB, MAC, NBI.
Hanid and Kiniaruh 1046; Faden 677.

14. Acalypha ornata *A. Rich.* (see p. 214)

A woody shrub to 3 m tall, with ovate leaves.
Rare plant found in warm wetter forest, 3000-5000 ft. MUM, KIS, KIT, NAR, EMB, MAC, KAJ.
Tweedie 66/88; Glover 5100.

5. TRAGIA *L.*

Herbs or climbers, often with stinging hairs, and with usually cordate leaves (in ours); flowers usually in axillary racemes with 1-3 female at base and many terminal male, but sometimes dioecious; male flowers bracteate, of 3 sepals and 3 free stamens; female flowers with 3 or 6 pinnate or palmate sepals becoming enlarged in fruit and 3-seeded ovary; stigmas 3, entire, joined at base.

1 Sepals of female flowers 3 — 2
  Sepals of female flowers 6 — 3
2 Plant erect; leaves subsessile, often clasping at base, coarsely dentate with teeth over 1 mm high — 1. *Tragia subsessilis*
  Plant climbing; leaves conspicuously petiolate, cordate, finely serrate, the teeth up to 1 mm high — 2. *Tragia scheffleri*
3 Leaves cordate at base — 4
  Leaves rounded or truncate at base — 5
4 Pinnae on female sepals 6-7, stiff, linear — 3. *Tragia insuavis*
  Pinnae on female sepals 4-5, flexuous, capillary — 4. *Tragia brevipes*
5 Erect shrub with ovate bracts to female flowers — 5. *Tragia* sp. *A*
  Climbing plant with suborbicular bracts to female flowers — *Tragiella natalensis*

1. Tragia subsessilis *Pax*

An erect or spreading perennial suffruticose herb without stinging hairs, and with sessile or subsessile coarsely dentate oblong leaves, sometimes clasping the stem at base.
An uncommon plant found in dry *Commiphora* bushland. EMB, MAC.
Bogdan 4436.

2. Tragia scheffleri *Baker*

A climbing herb, not stinging, with ovate-oblong, cordate leaves.
Apparently so far recorded only from one specimen from the drier lakeside of west Kenya. MUM.
Agnew, Musumba, and Kiniaruh 8069.

3. Tragia insuavis *Prain*

A climbing or trailing perennial herb with stinging hairs especially on the stems, and with ovate, cordate, often almost glabrous leaves.
Rather uncommon in dry bushland, and very variable. NAR, MAG, MAC, KAJ.
Bogdan 413.

4. Tragia brevipes *Pax* (see p. 217)

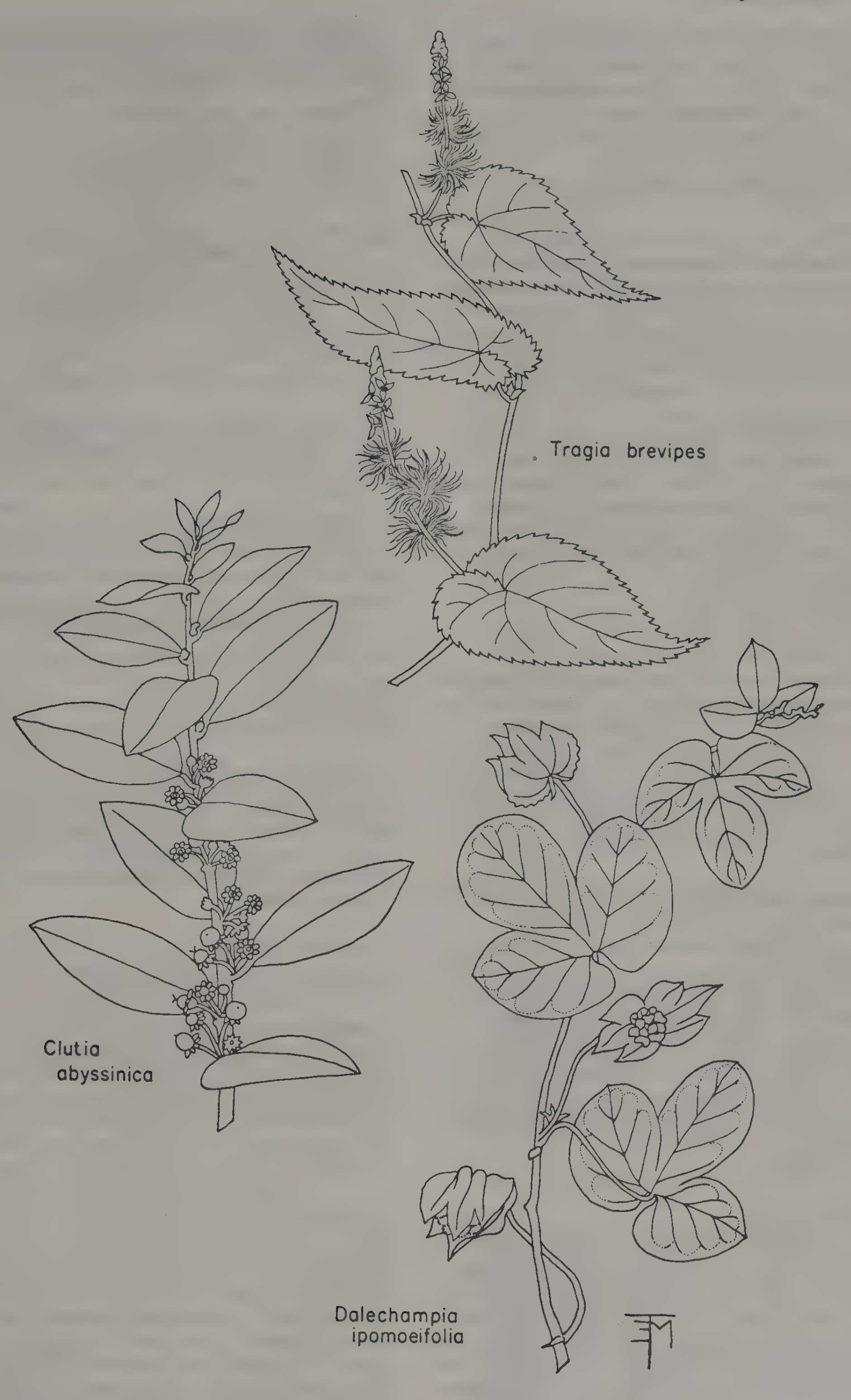
A climbing herb, sometimes woody at base, with stinging hairs (especially on the fruits) and ovate to sub-orbicular, acuminate, cordate leaves.
Fairly common at edges of upland dry forest types, this plant is one of the principal stingers of Upland Kenya. HE, HC, HT, HA, KIT, MUM, KIS, NAR, NBI.
Strid 2879; Leippert 5229.

5. Tragia *sp.* **A.**

An erect shrub without stinging hairs, and with the leaves oblong, truncate at base.
This species has only been collected once, in black soil at Machakos. More material is badly needed. MAC.
Thomas 757.

6. TRAGIELLA *Pax & K. Hoffm.*

A genus very similar to *Tragia* but with the stigmas fused almost to the tip, forming a hollow entire column.


Tragia brevipes
Clutia abyssinica
Dalechampia ipomoeifolia

Tragiella natalensis (*Sond.*) *Pax & Hoffm.*

A twining climber, sometimes annual, with stinging hairs and elliptic-oblong leaves, widest in the middle and ± truncate at base.

Locally common in dry forest in Upland Kenya. HA, NAR, RV, NBI, KAJ.

van Someren 2409; Agnew 7925.

7. RICINUS *L.*

Herbs or shrubs with palmatisect, stipulate leaves; flowers in panicles, monoecious; male flowers with sepals 3–5, petals 0 and stamens very numerous borne on branching filaments; female flowers with caducous sepals and no disc; ovary with 3 ovules and a twice-divided stigma; seeds 3.

Ricinus communis *L.*

A tall annual or perennial herb, sometimes branching above, with large 5–9-palmatisect leaves; panicles terminal; capsule often softly prickly.

Widely cultivated (as Castor Oil) and spontaneous in dry country. HE, HA, MUM, NAR, RV, MAG, NBI.

Hanid and Kiniaruh 639.

8. DALECHAMPIA *L.*

Usually climbers with twining stems and alternate leaves; flowers monoecious, in dense axillary peduncled heads, subtended and ± enclosed by a pair of leafy bracts; male flowers without disc or petals, with 4–6 calyx lobes and 20–30 stamens fused into a central column; female flowers with 5–12 sepals becoming enlarged in fruit, and an entire stigma.

Dalechampia ipomoeifolia *Benth.* (*D. scandens* auct.) (see p. 217)

A twining perennial with 3–5-lobed palmatifid leaves; bracts subtending inflorescence often acutely 3-lobed at tip, ovate, yellow; fruit surrounded by 9–12 stiff-spreading calyx lobes.

A common plant in disturbed *Commiphora* bushland in dry country, often growing by roadsides or around habitations. The sepals in fruit develop extremely irritating stinging hairs. MAG, MAC, KAJ.

Agnew 5415.

9. JATROPHA *L.*

Herbs or shrubs, sometimes tuberous at base, usually with palmatifid leaves; flowers in terminal or axillary cymes, monoecious; male flowers with 5 sepals and petals and ± 5-lobed disc, and 8 stamens in two series (5 + 3) with connate filaments; female flowers similar to the male but without the stamens and with a usually 3-celled ovary, with connate, shortly bifid styles.

A genus of dry-land plants, rather rare in our area. *J. curcas* L. is cultivated as the 'physic-nut' for its medicinal qualities.

1 Plants with spiny stipules — 2
  Plants unarmed — 4
2 Spines in pairs only, each spine undivided — 3
  Spines divided or in paired clusters — 1. *J. fissispina*
3 Spines more than 15 mm long; leaves orbicular, densely woolly — 2. *J. ferox*
  Spines less than 8 mm long; leaves obovate, alternate, sparsely pubescent to almost glabrous — 3. *J. parvifolia*
4 Tree or shrub to 2 m or more; leaves stiff, shallowly lobed; stipules entire — 4. *J. curcas*
  Weak shrub to 1 m; leaves deeply palmatifid; stipules divided into capillary segments — 5. *J. spicata*

1. **Jatropha fissispina** *Pax*

A shrub to about 1·5 m tall, with a soft, fleshy stem and orbicular, palmatifid, tomentose leaves; flowers green.

Rare plant found in the Magadi area. MAG.

Bally 7138.

2. **Jatropha ferox** *Pax*

In KTS. p. 206. MAC.

3. **Jatropha parvifolia** *Chiov.*

A shrub to nearly 3 m, with clusters of sinuate, obovate small (to 4 cm long) leaves; flowers small, inconspicuous.

Rare plant found in the Magadi area. MAG.

Bally B2646.

4. **Jatropha curcas** *L.*

Cultivated in MUM, MAC, and NBI.

5. **Jatropha spicata** *Pax*

A low shrub with swollen rootstock and deeply divided leaves; flowers green.

Uncommon plant found in dry country. MAG, KAJ.

Napper 1256A.

10. CLUTIA *L.*

Monoecious or dioecious herbs or shrubs (rarely small trees) with alternate, entire, stipulate leaves which turn conspicuously orange or red before falling; flowers in axillary fascicles with 5 sepals bearing glands at base, and 5 petals; disc usually present as glands under the petals in male flowers; male flowers with 5 stamens shortly declinate from a central column, the column with a terminal

truncate sterile ovary; female flowers with usually free styles and once-divided stigmas, fruit with one red seed per loculus, dehiscent.

1 Leaves oblong to oblanceolate, pubescent; male flowers with 5 glands on disc at base of petals; female flowers with 3 stalked glands on base of sepals 1. *C. robusta*
 Leaves ovate to lanceolate or elliptic, rarely oblanceolate, commonly glabrous; male flowers with more than 5 glands on disc at base of petals; female flowers with 2 (often confluent) glands on base of sepals 2. *C. abyssinica*

1. Clutia robusta *Pax*

A woody shrub to 2 m, dioecious or often with a few female flowers on each male plant; leaves oblong or oblanceolate, pubescent. Common in dry highland bushland, 8000–10 500 ft. HE, HT, HM, HA, HK.

Agnew, Azavedo, and Khatri 9520; Greenway 7850.

2. Clutia abyssinica *Jaub. & Spach* (*C. mollis, C. pedicellaris* of Check List) (see p. 217)

A dioecious woody shrub to 2 m with a variable leaf shape (ovate to oblanceolate or elliptic, obtuse or acute), a variable indumentum (nearly glabrous to densely velvety-pubescent) but with very constant floral characters as given in the Key. As here defined this is our commonest *Clutia*, occurring throughout the upland area at forest edges to 9000 ft. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, NAR, RV, NAN, NBI, KAJ.

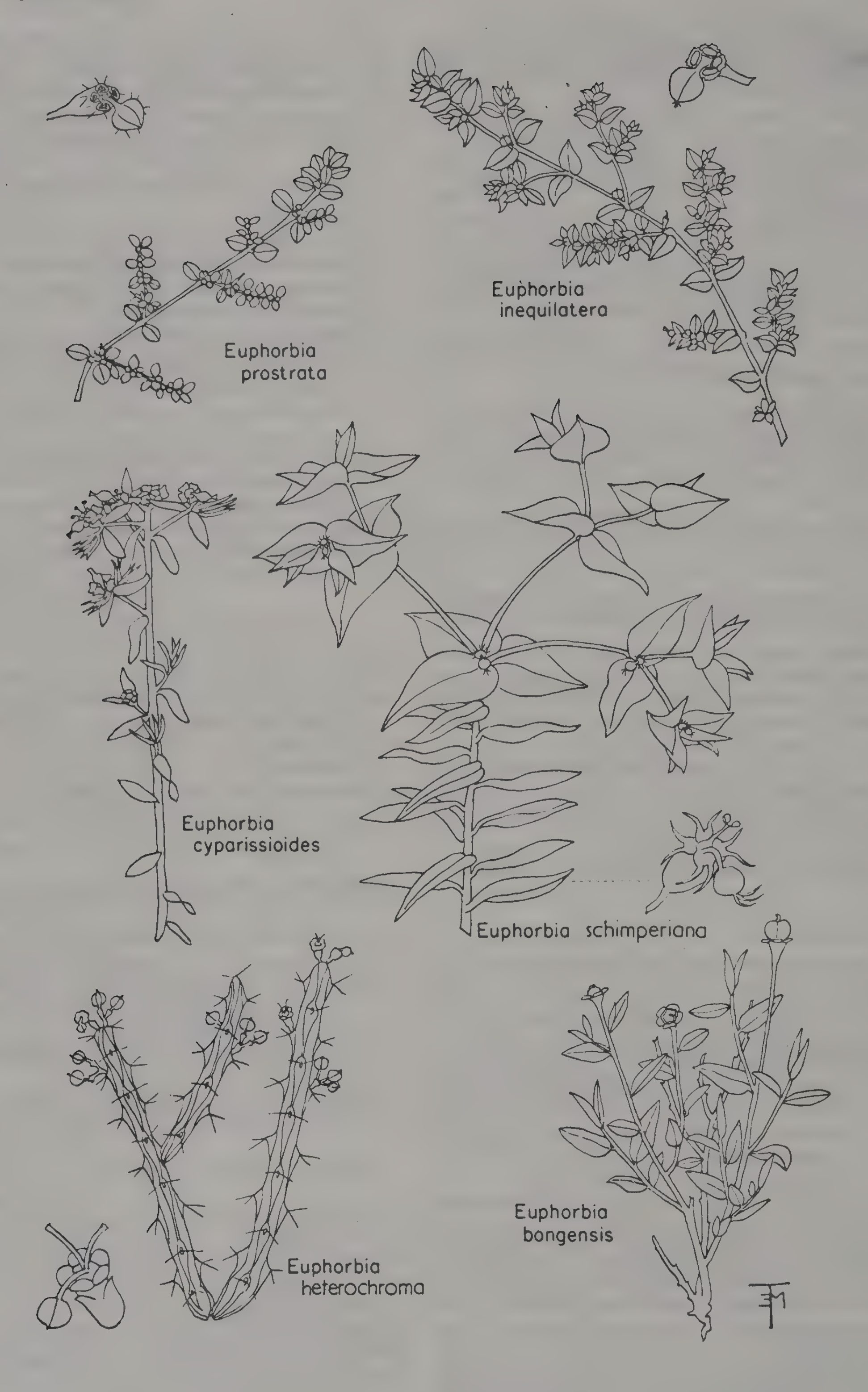
Agnew, Azavedo, and Khatri 9560; Polhill and Lucas 11.

11. EUPHORBIA *L.*

Herbs, shrubs, or trees with simple alternate or opposite leaves, with or without stipules; flowers much reduced to single stamens (male flowers) and single gynoecium (female flowers) and crowded in a cymose capitulum with linear bracts, called a *cyathium*; cyathia solitary or arranged in dichasial cymes, each with one central female flower and many peripheral male flowers; involucre of cyathium regular, bearing 1–5 glands and 5 scale-teeth; fruit a capsule with 3 1-seeded loculi.

An abundant genus, including the succulent candelabra trees. In the following account only those species which may be taken for low shrubs or climbers, as well as all herbs, are keyed out. The remainder will be found in KTS pp. 181–222.

1 Plant unarmed 2
 Plant spiny 28
2 Plant stemless, flowering before the leaves; leaves in a rosette 1. *E. rubella*
 Plant with leaves at flowering time, with a stem; leaves not in a rosette 3
3 All leaves opposite 4
 At least the lower leaves alternate 11
4 Cyathia in axillary, pedunculate clusters 2. *E. hirta*
 Cyathia solitary, axillary or at dichotomies 5
5 Leaves linear 3. *E. arabica*
 Leaves oblong to orbicular 6
6 Perennials with thickened rootstock; appendages of involucral glands orbicular, conspicuous, white or pink 7
 Annuals or weak perennials with appendages of involucral glands small, broader than long, inconspicuous 8
7 Leaves orbicular; peduncle less than 2·5 times as long as the involucre 5. *E. rivae*
 Leaves oblong; peduncle more than 2·5 times as long as the involucre 4. *E. zambesiaca*
8 Plant entirely glabrous 6. *E. inaequilatera*
 Plant hairy at least on the stem 9
9 Appendages of involucral glands white, lobed, visible under a lens; capsule often glabrous 7. *E. mossambicensis*
 Appendages of involucral glands obscure, not lobed; capsule hairy 10
10 Stem hirsute all round 8. *E. granulata*
 Stem with a line of pubescence along the upper side only 9. *E. prostrata*
11 Annuals 12
 Perennials 17
12 Involucre with only one lateral gland 10. *E. geniculata*
 Involucral glands more than one, regularly arranged 13
13 Petiole equalling half lamina-length; cyathia on axillary branchlets, never terminal to the main, monopodial branches 11. *E. acalyphoides*
 Petioles shorter than half lamina-length; cyathia terminal on dichotomising, sympodial, principal branches 14
14 Majority of cyathia held in terminal corymbs 16
 Majority of cyathia solitary at nodes 15
15 Capsule tomentose, with spreading hairs 12. *E. crotonoides*
 Capsule pubescent, with appressed hairs 13. *E. systyloides*
16 Cyathia subtended by linear bracts; ovary pubescent 15. *E. agowensis*
 Cyathia subtended by triangular, orbicular to reniform bracts which clasp the stem; ovary glabrous 17
17 Glands of involucre divided into 4 or more branched processes 14. *E. pseudograntii*
 Glands of involucre entire or with only 2 points 18



Euphorbia inequilatera
Euphorbia prostrata
Euphorbia cyparissioides
Euphorbia schimperiana
Euphorbia heterochroma
Euphorbia bongensis

18 Involucral glands entire or obscurely crenate 22
Involucral glands crescent-shaped with two horns 19
19 Bracts of the inflorescence triangular, pointed at the apex 20
Bracts of the inflorescence reniform or orbicular, rounded at apex 21
20 Involucral glands with two ± filamentous horns from a ± oval body 16. *E. schimperana*
Involucral glands with the body passing gradually into the abruptly tapering, awned horns 17. *E. repetita*
21 A many stemmed herb; leaves oblong to 3 cm long 18. *E. wellbyi*
A branched loose shrub; leaves elliptic to 20 cm long 19. *E. engleri*
22 A fleshy-stemmed climber; leaves soon falling 20. *E. gossypina*
Erect woody herbs or shrubs 23
23 Leaves obovate, rounded at apex 21. *E. polyantha*
Leaves elliptic to oblong, if obovate-elliptic then acute at apex 24
24 Capsule warty 22. *E. depauperata*
Capsule smooth 25
25 Leaves obovate-elliptic 24. *E. ugandensis*
Leaves oblong or linear 26
26 Cyathia glabrous externally; capsules glabrous 27
Cyathia finely pubescent externally; capsules spreading-pubescent 23. *E. bongensis*
27 Leaves obovate-elliptic, 2–8 cm long 24. *E. ugandensis*
Leaves narrow-oblong or linear, less than 2 cm long 25. *E. cyparissoides*
28 Spines solitary 26. *E. graciliramea*
Spines in pairs 29
29 Spines forking more than half way up a common stalk 27. *E. glochidiata*
Spines separate from the base or with a short common stalk 30
30 Stem irregularly lobed with wings or protuberances 31
Stem quadrangular or cylindrical, not lobed 32
31 Stem with flattened portions, often semicircular at apex 28. *E. buruana*
Stem with fleshy spine-pointed lobes 29. *E. brevitorta*
32 Spines fused in pairs at base 33
Spines free at base 34
33 Spine shields horizontally prolonged with accessory hooked prickles at end of horizontal arms 30 *E. uhligiana*
Spine shields not horizontally prolonged, accessory prickles absent or, if any, straight 32. *E.* sp. *A*
34 Cartilaginous stem-margin (on which the spines are set) continuous 35
Cartilaginous stem margin interrupted 32. *E.* sp. *A*
35 Stems ascending, less than 1·5 cm thick; heads dark red 33. *E.* sp. *B*
Stems erect, over 1·5 cm thick; heads yellow 31. *E. heterochroma*

1. Euphorbia rubella *Pax*

Perennial from a fleshy tuber with its apex at soil level; leaves suborbicular to elliptic, rounded at base and apex; bracts white and pink; involucral glands 6, yellow, entire.

A rare plant found in dry rocky country only recorded from south Elgon. HC, KIT.

Tweedie 69/12.

2. Euphorbia hirta *L.* (see p. 224)

An annual or weak perennial with prostrate branches and lanceolate-elliptic, often maculate leaves; cyathia in pedunculate clusters.

A common weed in the drier parts of our area. HE, KIT, MUM, KIS, BAR, RV, MAC, NBI, KAJ.

Hanid and Kiniaruh 814; Faden 67196.

3. Euphorbia arabica *Boiss.*

An erect glabrous annual to 30 cm tall, loosely branched above, with linear leaves.

Rare plant found in very dry country in the north of our area. BAR.

Leippert 5200.

4. Euphorbia zambesiaca *Benth.*

An often hairy perennial with a heavy woody rootstock and ascending stems to 20 cm; leaves oblong.

Rare plant found in upland grassland in the south of our area, this plant is found in Tanzania and Zambia. HL.

van Someren in EAH 12279.

5. Euphorbia rivae *Pax*

A perennial with a swollen fleshy rootstock and short prostrate branches, sparsely hairy, bearing orbicular leaves.

A local plant of shallow soils, particularly common around Nairobi. EMB, MAC, NBI.

Agnew 8813; Verdcourt 1962.

6. Euphorbia inaequilatera *Sond.* (see p. 220)

A prostrate or erect glabrous annual with asymmetric oblong leaves and very inconspicuous cyathia.

Common in waste ground and dry managed grassland and pastures. Said to be palatable to cattle. HE, HT, HM, KIT, MUM, KIS, NAR, RV, MAG, NBI, KAJ.
Hanid 251; Glover 2717.

7. Euphorbia mossambicensis (*Kl. & Gke.*) *Boiss.*
A prostrate annual with hairy stems and asymmetric leaves; the glandular appendages of the cyathia are difficult to see, and the distinctness of this species from the next needs confirmation.
Dry river beds in *Acacia* bushland. MAG.
Polhill and Greenway 451.

8. Euphorbia granulata *Forsk.*
A prostrate, sparsely hirsute annual with asymmetric leaves and inconspicuous cyathia.
Uncommon plant found in disturbed places in dry country, MAC, NBI.
Hanid and Kiniaruh 891; Faden 67195.

9. Euphorbia prostrata *Ait.* (see p. 220)
Very similar to the last species except for the line of pubescence only on the upper side of the stem.
Locally common as a weed of lawns and grassland throughout Kenya. KIS, KIT, NBI.
Tweedie 66/62; Bally 6571.

10. Euphorbia geniculata *Orteg.*
An erect, often unbranched, glabrescent annual with elliptic leaves; cyathia with only one, lateral, funnel-shaped gland.
An introduced common weed of cultivation in dry country. MUM, KIS, RV, MAC, NBI, KAJ.
Agnew 9673; Bally 8394.

11. Euphorbia acalyphoides *Boiss.*
An erect pubescent annual with ascending branches from the base, and petiolate, spathulate or obovate leaves; cyathia with hairy glands.
A rare *Euphorbia* of disturbed *Acacia* bushland. NAN, MAG.
Verdcourt 2757.

12. Euphorbia crotonoides *Boiss.* (see p. 224)
An erect, branched pubescent annual with lanceolate leaves narrowing into a short petiole; cyathia with entire, stalked glands; capsule with spreading white hairs, each hair almost half as long as the style.
The commonest annual weedy *Euphorbia* of cultivation and disturbed ground. HM, HA, KIT, MUM, NAR, RV, MAC, KAJ.
Agnew, Musumba, and Kiniaruh 7981; Verdcourt 1968.

13. Euphorbia systyloides *Pax*
Very similar to the last species except for the pubescent capsule with the hairs appressed.
Less common than *E. crotonoides* as a weed of cultivated ground and disturbed places in dry country. RV, MAC, NBI, KAJ.
Hanid and Kiniaruh 580; Bally 7704.

14. Euphorbia pseudograntii *Pax*
Herb or shrub with soft fleshy stems and oblanceolate leaves. It is dealt with in KTS p. 200. EMB, MAC.

15. Euphorbia agowensis *Boiss.*
An erect annual, branched above, with oblong or linear glabrous leaves; cyathia, at least the older ones, borne in groups of 2–5 in a loose corymb; involucral glands entire; capsule pubescent.
An uncommon *Euphorbia* of dry country. MAG, NAN, KAJ.
Agnew 9795; Glover and Samuel 2802.

16. Euphorbia schimperana *Scheele* (see p. 220)
An erect annual or short-lived perennial with usually narrowly elliptical leaves and deltoid triangular, clasping bracts, glabrous or hairy on all parts; involucral glands with a central crescent-shaped or oval body, abruptly joined to a filamentous horn at each end.
The commonest mountain *Euphorbia*, growing by roadsides and at forest edges. HE, HT, HM, HA, HK, KIT, KIS, RV, NBI, KAJ.
Hanid and Kiniaruh 605; Mathenge 198.

17. Euphorbia repetita *A. Rich.*
An erect perennial or, more rarely, annual with narrow-oblong leaves and long triangular bracts, often with a tuft of hairs below the nodes only; involucral glands narrowing gradually into a short, rapidly tapering incurved horn at each end.
Locally common in the drier highlands. HE, HT, HM, HA, HK, KIT.
Strid 3276; Napier 5957.

18. Euphorbia wellbyi *N. E. Br.*
Perennial from woody rhizomatous rootstock with erect, sparsely branched stems; leaves oblong, clasping at base; bracts of inflorescence orbicular.
An uncommon plant found in wet meadows within the upper forest limits. HE, HM, HA, HK.
Rauh Ke 518; Agnew 10002.

19. Euphorbia engleri *Pax*
A loose soft shurb with elliptic leaves; inflorescence an umbel of ± unbranched rays with orbicular bracts at intervals.

A common plant of shade within montane rain forest. HE, HM, HA, HK, HN, KIT, KAJ.
Mainwaring 2499; Agnew 8685.

20. Euphorbia gossypina *Pax*

A fleshy-stemmed shrub often trailing over trees, with oblong, acute, ephemeral leaves; inflorescence of umbellate cyathia which are white-woolly within.
Locally common in rocky bushland on shallow soils. HA, NAR, RV, NAN, MAC, NBI.
Wilkinson 313/60; Agnew, Hanid, and Kiniaruh 7865.

21. Euphorbia polyantha *Pax*

A much branched perennial shrub of dry *Commiphora* woodland dealt with in KTS p. 200. MAG, KAJ.

22. Euphorbia depauperata *A. Rich.* (see p. 224)

A perennial herb from a woody rootstock with ascending or erect branches and elliptic, mainly acute leaves; inflorescence bracts orbicular; ovary warty.
An uncommon plant of highland dry grassland. HE, HT, HM, HA, HK, KIT, RV.
Birch 61/64; Strid 2640.

23. Euphorbia bongensis *Peyr.* (see p. 220)

A low tortuous-branched shrub or, where burnt, herb with woody rootstock and oblong to narrowly elliptic, glabrous leaves; cyathia pubescent, solitary; capsules pubescent.
Rare plant found in western Kenya. KIT.
Brodhurst-Hill 469.

24. Euphorbia ugandensis *Pax*

An erect, much-branched shrub with elliptic leaves; inflorescence bracts reniform.
Uncommon plant found in montane rain-forest clearings and roadsides. HM, HA, HK.
Agnew and Lind 5634; Bally 1161.

25. Euphorbia cyparissoides *Pax* (see p. 220)

A perennial herb with many erect stems, usually densely covered with stiff narrow leaves.
Rare plant found in high altitude grassland. HC, HA, KIT.
Irwin 358.

26. Euphorbia graciliramea *Pax*

Perennial herb from a woody rootstock, with prostrate, succulent, ± cylindrical stems bearing 3 simple spines (2 small and 1 large) on each spine-shield.
Locally common in dry rocky country. This may eventually prove to be a subspecies of *E. triaculeata* Forsk. NAR, RV, MAG, NAN, NBI, KAJ.
Hanid and Kiniaruh 897; Glover, Gwynne, and Samuel 1546.

27. Euphorbia glochidiata *Pax*

Perennial herb from a woody rootstock with trailing, rooting, succulent, ± cylindrical stems bearing 3 spines (2 small, 1 long and forked at apex) on each spine-shield.
Locally common in dry rocky country in the Athi River district. MAC, KAJ.
Agnew 5613; van Someren 4104.

28. Euphorbia buruana *Pax*

Perennial herb from a swollen fleshy root tuber, bearing many erect succulent, often variegated, irregularly winged stems with paired spines of various sizes.
Locally common in dry country. NAR, MAG, KAJ.
Classen 28.

29. Euphorbia brevitorta *Bally*

A densely tufted succulent with short unbranched spiny stems from a fleshy tuber.
Uncommon plant found in rocky grassland. NBI.
Classen 47.

30. Euphorbia uhligiana *Pax*

Perennial herb from a woody tap-root, with many erect succulent, angled-cylindrical stems bearing paired spines at apices of blunt lobes; spines fused at base.
Rare plant found in dry stony country. RV.
Glover 4066; Classen 52.

31. Euphorbia heterochroma *Pax* (see p. 224)

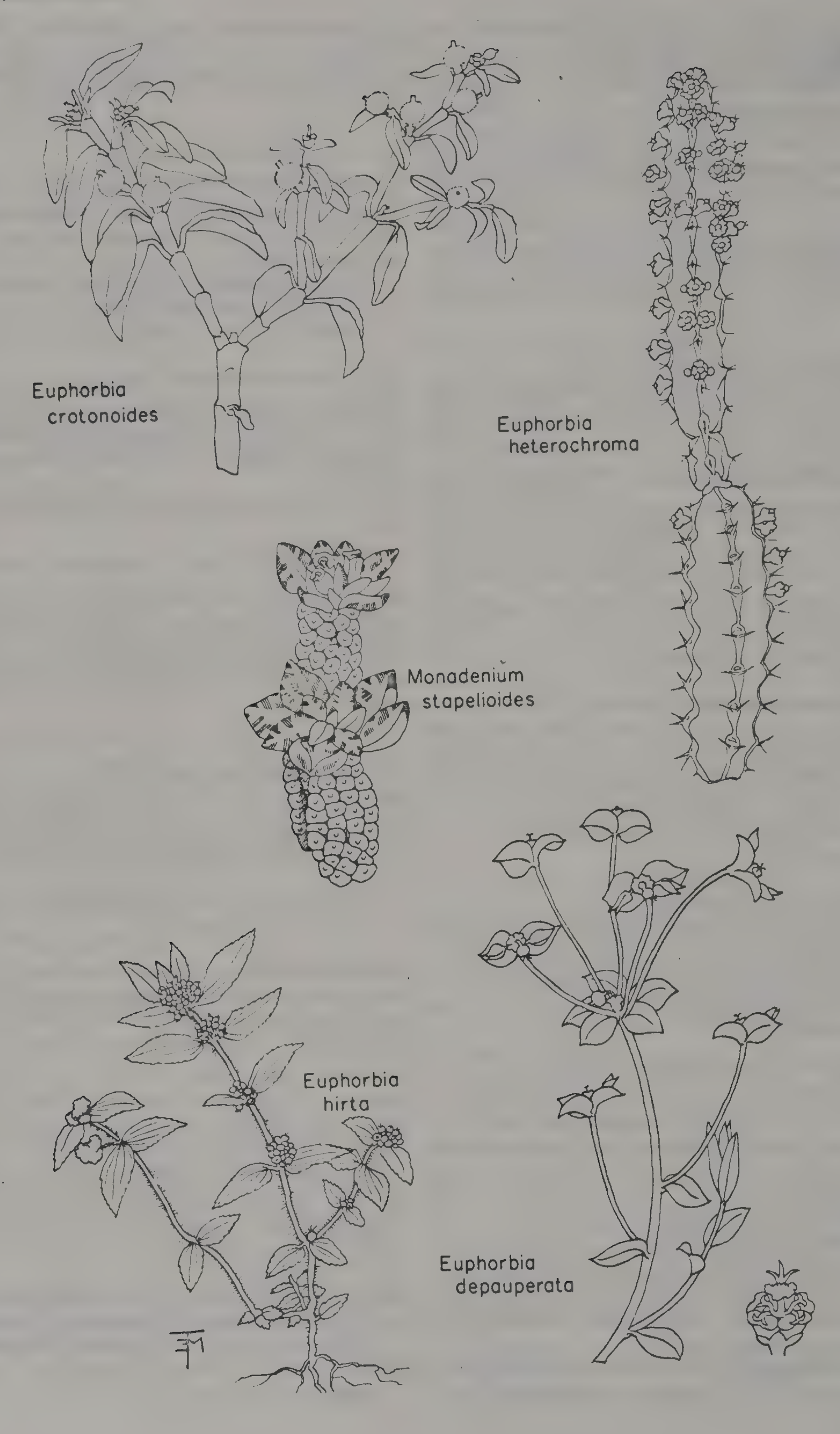
A low shrub dealt with in KTS p. 198. BAR, MAG, MAC, KAJ.

32. Euphorbia *sp.* **A.**

Similar to *E. uhligiana* except for the more cylindrical stems and with longer peduncles to the heads.
Rare plant found in dry rocky country. EMB, MAC.
Napper 1658.

33. Euphorbia *sp.* **B.**

Similar to *E. uhligiana* except for the spines which are well separated on the interrupted spine-shield.
Rare plant found in dry stony country. BAR, NAN.
Classen 68; Napper 1124.


Euphorbia
crotonoides
Euphorbia
heterochroma
Monadenium
stapelioides
Euphorbia
hirta
Euphorbia
depauperata

12. MONADENIUM *Pax*

Succulent herbs or shrubs similar to *Euphorbia* except for the cyathium which is zygomorphic, held in two usually fused bracts, and with the involucre bearing a continuous glandular rim except for the abaxial side where a slot allows the female flower to hang free.

A curious group of plants which occur rarely in dry country. They are never abundant and have formed a number of endemics in East Africa.

1 Plant herbaceous, with annual stems 2
  Plant woody at base, with perennial stems 4
2 Cyathia held in pairs or threes 1. *M. trinerve*
  Cyathia solitary 3
3 Leaves crowded at stem apex and held on fleshy protuberances of the stem; cyathia 7–9 mm long 2. *M. rhizophorum*
  Leaves spaced along the cylindrical stem, not borne on protuberances; cyathia up to 6·5 mm long 3. *M. montanum*
4 Leaves held on fleshy, persistent protuberances of the stem, crowded 5
  Leaves spaced along the stem, not on fleshy protuberances 4. *M. invenustum*
5 Bract around cyathia whitish; gland of involucre red 5. *M. stapelioides*
  Bract around cyathia green; gland of involucre yellow 6. *M. yattanum*

1. Monadenium trinerve *Bally*

A perennial herb from a spherical tuber, with fleshy elliptic leaves and usually paired cyathia.

Rare plant found in dry country. MAC.

MacArthur in Bally E 109.

2. Monadenium rhizophorum *Bally*

A perennial erect succulent herb from a cylindrical tuber with fleshy elliptic leaves held on stem protuberances, and solitary cyathia.

Rare plant found in dry country. RV, MAC, KAJ.

Graham 2241; Agnew 10847.

3. Monadenium montanum *Bally*

Similar to *M. rhizophorum* but with the stems thinner, without protuberances, and with smaller cyathia.

Rare plant found in dry country. MAC, KAJ.

Record from P. R. O. Bally (1961) *The genus Monadenium.*

4. Monadenium invenustum *N. E. Br.*

A perennial, loose, fleshy shrub with a solitary, cylindrical stem arising from a globose tuber; leaves sub-orbicular to elliptical, thinly succulent; cyathia in cymes of 3–7.

Locally common, growing (never abundantly) in *Commiphora* bushland. MAC, KAJ.

Bally 592.

5. Monadenium stapelioides *Pax* (see p. 224)

A herb with short, fleshy, tuberculate, perennial stems arising from a tuberous rootstock; leaves elliptic to obovate; cyathia in pairs with a reddish involucral gland and pale bracts.

Locally common in dry rocky screes and cliffs in dry grassland. NAR, BAR, RV, MAG, NAN.

Bally 27.

6. Monadenium yattanum *Bally*

Very similar to *M. stapelioides* but differing in the less densely tuberculate stem and in the green cyathial bracts with a yellow involucral gland.

Rare plant found in the Machakos area. MAC.

Bally B9750.

54. ROSACEAE†

Trees, shrubs, or herbs with alternate, stipulate mostly serrate leaves; flowers usually in racemes, bisexual, regular, but with many exceptions, always with flower parts (except ovary) borne on a cup-shaped receptacle; calyx, sometimes with epicalyx, of 5 fused or free lobes; petals 5, free or absent; stamens usually many, rarely few; carpels 1-many, superior, free or sometimes united to the receptacle and inferior, many-seeded; fruit fleshy or dry.

1 Flowers conspicuous, with expanded coloured petals or plant spiny 2
  Flowers inconspicuous, petals absent; plant never spiny 4
2 Plant spiny 4. *Rubus*
  Plant unarmed 3
3 Petals yellow; fruit dry 3. *Potentilla hispanica*
  Petals white; fruit fleshy 2. *Fragaria vesca*
4 Shrub over 1 m tall, with glabrous leaves; flowers unisexual 5. *Cliffortia nitidula*
  Herbs or, if shrubby, then less than 1 m tall and the leaves hairy; flowers bisexual 1. *Alchemilla*

1. ALCHEMILLA *L.*

Perennial herbs or low shrubs with or without a basal leaf rosette; leaves palmate or palmately lobed, rounded in outline; inflorescence a simple or diffuse panicle of cymes; flowers small, bisexual, with parts in fours; epicalyx present; sepals 4, at the top of an obconical receptacle tube;

† By A. D. Q. Agnew and S. Kibe.

petals 0; stamens 4, with the disc partly closing the throat of the receptacle tube; carpels 2–12, free from each other, each with a basal style and capitate stigma; fruit of achenes retained within the receptacle tube.

1 Erect shrubs with sessile leaves — 2
Herbs or creeping shrubs with petiolate leaves — 3

2 Leaves deeply 3-lobed, with the central lobe apically broad and tridentate; lateral lobes lanceolate — 1. *A. argyrophylla*
Leaves unlobed, wedge-shaped, dentate or entire at the broad apex — 2. *A. elgonensis*

3 Trailing shrubs or wiry herbs with leaves evenly distributed throughout the stems, and without leaf rosettes — 4
Herbs producing leaf rosettes as well as leafy trailing stolons — 7

4 Stipules entirely papery; leaf lobes 9 or more, each triangular, acute — 3. *A. hageniae*
Stipules with a green leafy apex; leaf lobes 5 or fewer, rounded or notched — 5

5 Stems woody at base; epicalyx much smaller than calyx lobes — 4. *A. johnstonii*
Stems herbaceous throughout; epicalyx almost as big as or bigger than the calyx — 6

6 Receptacle, calyx, and epicalyx glabrous — 5. *A. ellenbeckii*
Receptacle, calyx, and epicalyx hairy — 8. *A. cryptantha*

7 Epicalyx lobes longer than calyx lobes — 8
Epicalyx lobes shorter than or equal to calyx lobes — 10

8 Leaves lobed to half the diameter or more, each lobe oblong to obovate bearing 9–13 teeth on each side of the midrib — 6. *A. kiwuensis*
Leaves lobed to less than half the diameter; each lobe as wide as long, with up to 6 teeth on either side of the midrib — 9

9 Stipules membranous, entire or with green teeth at apex; leaf lobes with 5–7 teeth — 7. *A. microbetula*
Stipules with a green leafy apex; leaf lobes with 9–11 teeth at apex — 8. *A. cryptantha*

10 Pedicels 3–50 mm long — 11
Pedicels 1 mm long or less — 13

11 Underside of leaf glabrous and smooth except for major radiating veins; leaf lobes truncate — 9. *A. cyclophylla*
Underside of leaf hairy with a raised venation; leaf lobes rounded — 12

12 Hairs on underside of leaf appressed and silky-white — 10. *A. gracilipes*
Hairs on underside of leaf spreading and brownish-white — 11. *A. rothii*

13 Flowers in glomerules on pedunculate inflorescences — 12. *A. fischeri*
Flowers 1–2 hidden within the stipules — 7. *A. microbetula*

1. Alchemilla argyrophylla *Oliv.*

A low, much-branched shrub with the woody stems covered by brown stipules, and with silvery-hairy, deeply 3-lobed sessile leaves; flower clusters axillary.

Abundant and locally dominant, in well-drained alpine soils from 9000–14000 ft. HA, HK.

Agnew 7016; Kokwaro 32.

2. Alchemilla elgonensis *Mildbr.* (see p. 228)

Similar to *A. argyrophylla* except for the keyed leaf characters, this plant often flowers in its first year after fire. It replaces *A. argyrophylla* on Mount Elgon and Cheranganis.

Hedberg 224; Agnew, Kibe and Mathenge 10552.

3. Alchemilla hageniae *T. C. E. Fries*

A trailing wiry herb or soft shrub with silky hairs on all parts, and membranous stipules which almost cover the stem; leaves with acute shallow lobes; flowers in a pedunculate panicle.

Endemic on the Aberdares where it sometimes forms the dominant cover in *Philippia* woodland. HA.

Agnew and Menezes 7144; Polhill 168.

4. Alchemilla johnstonii *Oliv.*

A low woody straggling shrub with short erect glabrous or reddish-hairy branches and with small 3–5-lobed leaves; leaf lobes notched at apex; flowers on short slender lateral branches.

Common in wet alpine soils. HE, HC, HT, HA, HK.

Hedberg 2010; Isaac, March 1962.

5. Alchemilla ellenbeckii *Engl.*

Similar to *A. johnstonii* except for the keyed characters, this species is found in bare wet stony soils of streamsides and flushes in the alpine zone. HE, HC, HT, HM, HA, HK.

Lind 5173; Williams 558.

6. Alchemilla kiwuensis *Engl.*

A creeping, pubescent herb with rosettes of deeply 5–7-lobed leaves and raceme-like panicles of hairy flowers; fruits are nearly always present which inflate the receptacle tube in a characteristic way.

Locally common in highland grassland. HE, HT, HA, HK, MUM.

Verdcourt 601; Tweedie 68/59.

7. Alchemilla microbetula *Th. Fr. jr.*

Similar to *A. kiwuensis* but with the keyed differences and small, 1–2-flowered inflorescences almost hidden by the stipules.

Rare plant, only recorded for the Mount Elgon alpine zone. HE.

Hedberg 896.

8. Alchemilla cryptantha *A. Rich.*

Similar to *A. kiwuensis* but the basal rosette is often absent, and the leaves are more shallowly lobed.

Locally common in alpine and montane grassland. HE, HC, HT, HA, HK, KIT, NAR.

Bogdan 445; Tweedie 67/159.

9. Alchemilla cyclophylla *Th. Fr. jr.*

A prostrate herb with leafy stolons and rosettes of shallowly bluntly 5–9-lobed, almost glabrous leaves; flowers hairy, in short erect racemes.

Endemic to bare peaty soils on the Aberdares and Mount Kenya. HA, HK.

Verdcourt 3777; Agnew and Armstrong 8159.

10. Alchemilla gracilipes (*Engl.*) *Engl.*

Similar to *A. cyclophylla* except for the pointed leaf-lobes, the silky hairiness and the branched racemes.

Locally common in montane grassland. HC, HT, HM, HA, HK, RV.

Bogdan 338; Agnew, Azavedo and Khatri 9504.

11. Alchemilla rothii *Oliv.*

Similar to *A. cyclophylla* but with more hairy and rounded leaf lobes and (usually) branched inflorescences.

Locally common in the heath and bamboo zones of the mountains. HE, HM, HA, HK.

Battiscombe 1223; Agnew and Armstrong 8132.

12. Alchemilla fischeri *Engl.*

A trailing herb with rosettes of deeply 5–9-lobed, hairy leaves, the lobes obovate and rounded at apex; inflorescence a panicle of small masses of subsessile hairy flowers.

Endemic to the Aberdares and Mt. Kenya where it is common in *Philippia* woodland. HA, HK.

Agnew and Lind 5017; Verdcourt 3781.

2. FRAGARIA *L.*

Perennial stoloniferous herbs with trifoliolate or ternate leaves in a rosette; flowers in few-flowered cymes, pentamerous; epicalyx present; receptacle short, flat; petals 5, pink or white; stamens numerous; fruit a fleshy receptacle bearing scattered, dry achenes.

Fragaria vesca *L.*

A stoloniferous herb with ovate, serrate leaflets, hairy above; fruit covered with scattered achenes.

The strawberry. Once recorded from the Aberdares but never seen since. Possibly adventive from gardens. HA.

Record from FTEA.

3. POTENTILLA *L.*

Perenial herbs with pinnate or palmate leaves and solitary or cymose flowers; flowers bisexual; epicalyx present; sepals 5, on a short flat receptacle; petals 5, often showy; stamens numerous; carpels numerous, on a convex receptacle, each with a lateral style; fruit of dry achenes.

Potentilla pensylvanica *L.*

A tufted pubescent herb from a woody rootstock, with pinnate leaves and a terminal corymb of yellow flowers.

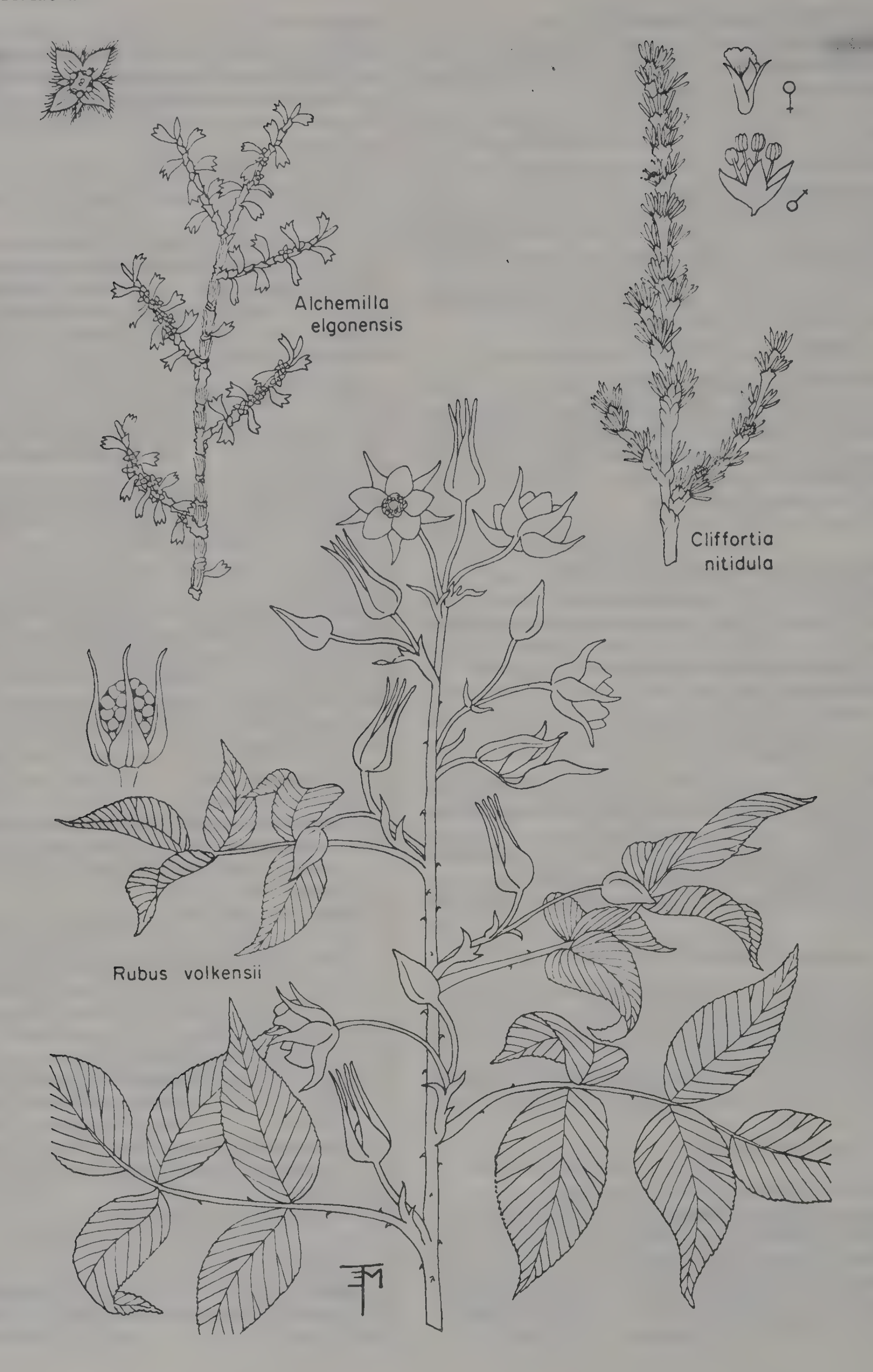
Possibly introduced and recently discovered on the Mau highlands in dry montane bush. HM.

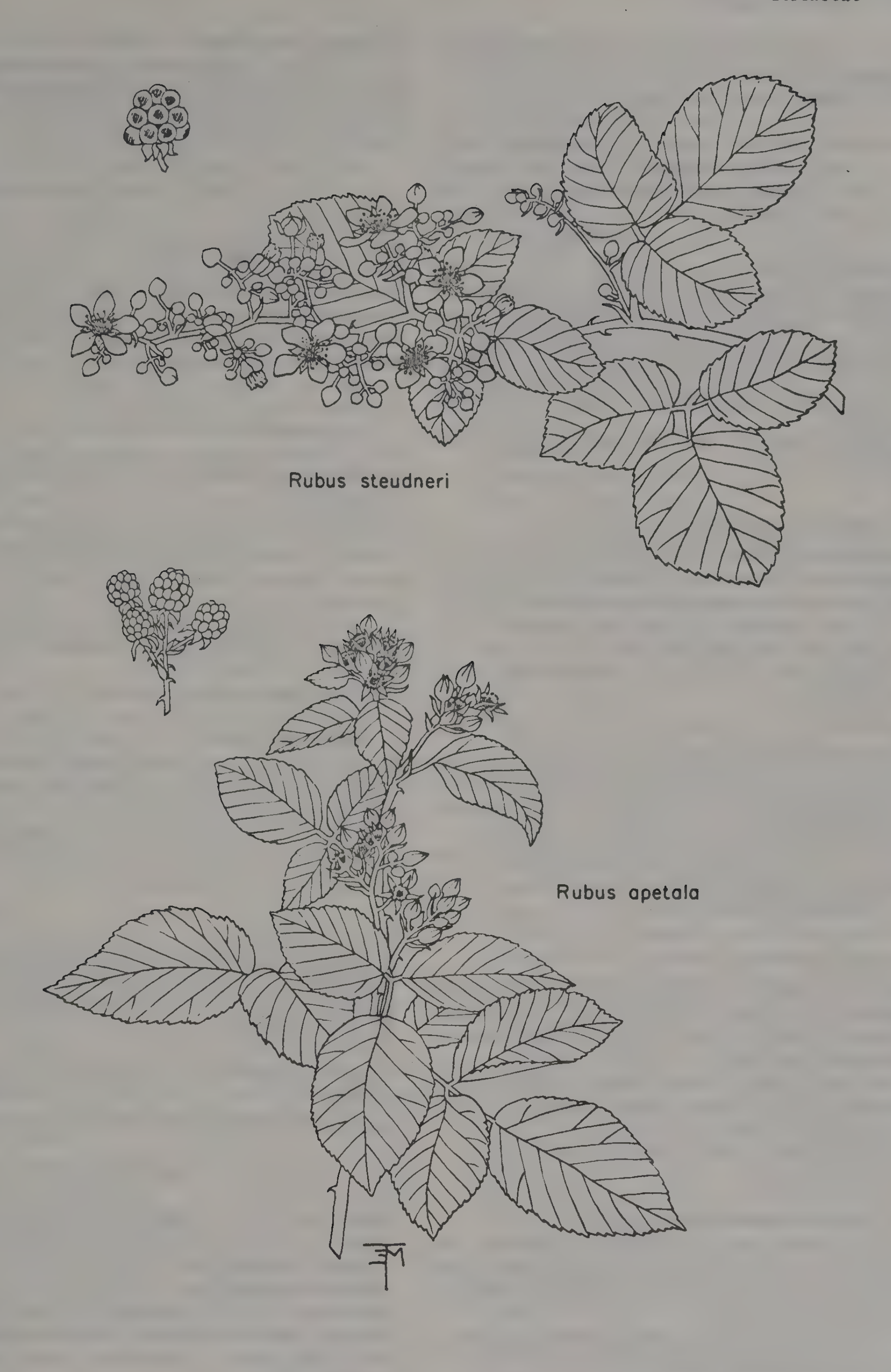
Greenway and Kanuri 13582.

4. RUBUS *L.*

Shrubs or herbs with palmately divided leaves and (in ours) armed erect or scrambling stems; flowers bisexual in terminal compound panicles; epicalyx 0; sepals 5, on a shallow receptacle; stamens numerous; carpels inserted on a convex receptacle each with 2 ovules and subterminal style; fruit of 1-seeded drupes.

1 Stem glabrous — 2
  Stem pubescent — 4
2 Leaves 3-foliolate; leaflets whitish-tomentose beneath, glabrous above — 1. *R. steudneri*
  Leaves more than 4-foliolate; leaflets glabrous on both surfaces — 3
3 Petals shorter than calyx; calyx 5–8 mm long — 2. *R. pinnatus*
  Petals longer than calyx; calyx 9–19 mm long — 3. *R. scheffleri*
4 Stems annual, erect — 5
  Stems perennial, scrambling, usually rooting on touching ground — 6
5 Receptacle cylindrically elongate; stem to 75 cm tall, scarcely pubescent, without glands — 4. *R. rosifolius*
  Receptacle globose; stem over 1 m tall, densely covered with capitate glandular hairs — 5. *R. volkensii*
6 Petals always exceeding calyx — 7
  Petals equal to or shorter than calyx or absent — 8
7 Leaflets densely whitish-tomentose beneath, glabrous above; leaflets elliptic to elliptic-ovate, 5·5 x 3 cm — 6. *R. friesiorum*


Alchemilla elgonensis
Cliffortia nitidula
Rubus volkensii


Rubus steudneri
Rubus apetala

Leaflets ± densely softly hairy and greenish beneath, pubescent above; leaflets broadly ovate to ovate-oblong 9·5 x 5·5 cm
7. *R. keniensis*

8 Petals usually absent or fugaceous; leaves usually imparipinnate 8. *R. apetalus*
Petals usually present and persistent; leaves usually trifoliolate 9. *R. rigidus*

1. Rubus steudneri *Schweinf.* (see p. 229)

A pubescent or tomentose scrambler with 3-foliolate leaves and purple flowers with large petals; drupes orange to dark red and glabrous.

Locally common in undergrowth in montane forest clearings and edges. HE, HC, HT, HM, HA, HK, KAJ.

Glover, Gwynne, and Samuel 1373; Tweedie 68/20.

2. Rubus pinnatus *Willd.*

A scrambling shrub with glabrous, glaucous stems and pinnate leaves; flowers pink in a lax panicle, petals shorter than sepals; drupes black, pubescent.

Locally common in upland rain-forest and bamboo. HE, HC, HT, HM, HA, HK.

Battiscombe 1191; Lind, Harris, and Agnew 5065.

3. Rubus scheffleri *Engl.*

Similar to *R. pinnatus* except for the key characters, the frequently trifoliolate leaves and the lack of glaucous bloom on the stem.

Uncommon plant found in upland rain-forest margins and glades. HC, HA, HN, KAJ.

Grant 1217; Agnew 9374.

4. Rubus rosifolius *Sm.*

An erect pubescent herb, with few prickles, pinnate leaves, and a leafy terminal inflorescence of white flowers; drupes very numerous becoming scarlet-red, succulent.

An introduced plant which appears to be spreading along stream banks in the Aberdares area. HA, MAC.

Faden 67576; Mathenge 232.

5. Rubus volkensii *Engl.* (see p. 228)

A large erect glandular (sticky) hairy herb with pinnate leaves and axillary as well as terminal small panicles of white flowers; drupes pubescent, orange-red, succulent.

Common in clearings within the upper forest and bamboo zones. HE, HA, HK.

Mwangangi 368; Agnew 8667.

6. Rubus friesiorum *C. E. Gust.*

A sub-erect pubescent to tomentose shrub with 3-foliolate leaves and a cylindrical terminal inflorescence of pinkish flowers; drupes glabrous or hairy.

Rare plant found at edges of montane rain-forest, 9000–10 000 ft, in the Aberdares. HA.

Hedberg 1996.

7. Rubus keniensis *Standl.*

A stout, scrambling, tomentose shrub with 3-foliolate leaves and whitish-pink flowers in a lax terminal panicle; drupes very large, turning orange, pubescent, watery and tasteless.

Locally common in wet montane forest on the Aberdares and Mt. Kenya. HA, HK.

Mathenge 383; Agnew 8736.

8. Rubus apetalus *Poir.* (*R. adolfi-friedericii* Engl.) (see p. 229)

A stout scrambling pubescent shrub with 5–7-foliolate leaves and a terminal inflorescence of green flowers; petals absent; drupes red or black, pubescent or glabrous.

A rather variable species of acid soils in drier montane forest and upland bushland. HE, HC, HA, HK, KIT, KIS, MAC.

Verdcourt 951; Agnew 9362.

9. Rubus rigidus *Sm.*

Similar to *R. friesiorum* except for its prickles (longer at 2 mm or more), puberulous leaflets and lanceolate (not obovate) petals.

Locally common at the edge of upland rain-forest, 3000–6500 ft. HA, HK, MUM, NBI, KAJ.

Verdcourt and Polhill 2976 (S).

5. CLIFFORTIA *L.*

Dioecious shrubs with trifoliolate or simple linear leaves and very reduced, solitary flowers; petals 0; stamens 3–50; fruit of 1–2 dry achenes enclosed by the calyx tube.

Cliffortia nitidula *R. E. & T. C. E. Fries* (see p. 228)

Described in KTS p. 401. HE, HC, HA, HK.

55. CAESALPINIACEAE†

Trees, shrubs, or herbs with alternate, stipulate, pinnate or bipinnate, rarely simple leaves; flowers bisexual, zygomorphic, in racemes; calyx of 5 free imbricate segments; corolla of 5 free petals, imbricate with the uppermost within the rest; stamens usually 10; ovary of one carpel, with a

† A. D. Q. Agnew.

terminal style and stigma; fruit a pod, dehiscent along opposite sides or indehiscent.

A large family of trees and shrubs. The genera and species keyed out in the following account are only those herbs, climbers, and shrubs which do not appear in KTS.

1 Plants spiny — 2
  Plants without spines — 3
2 Flowers white or cream, almost regular; pods winged, smooth — 4. *Pterolobium stellatum*
  Flowers yellow, zygomorphic; pods unwinged, prickly — 3. *Caesalpinia volkensii*
3 Climbers — 1. *Tylosema fassoglensis*
  Erect or prostrate herbs or shrubs — 2. *Cassia*

1. TYLOSEMA (*Schweinf.*) *Torre & Hillc.*

Climbers or trailers from a swollen rootstock with or without tendrils, and with simple bilobed leaves; flowers in racemes, yellow, heterostylic; sepals with the upper two fused, the rest free; petals 5, the uppermost smallest; stamens 10, but only two fertile; ovary with a long stalk; pods stalked, woody, 1–2-seeded.

Tylosema fassoglensis (*Schweinf.*) *Torre & Hillc.* (see p. 232)

A large trailing tendrillar climber with cordate, notched leaves; conspicuous flowers with yellow to pink crinkled petals.

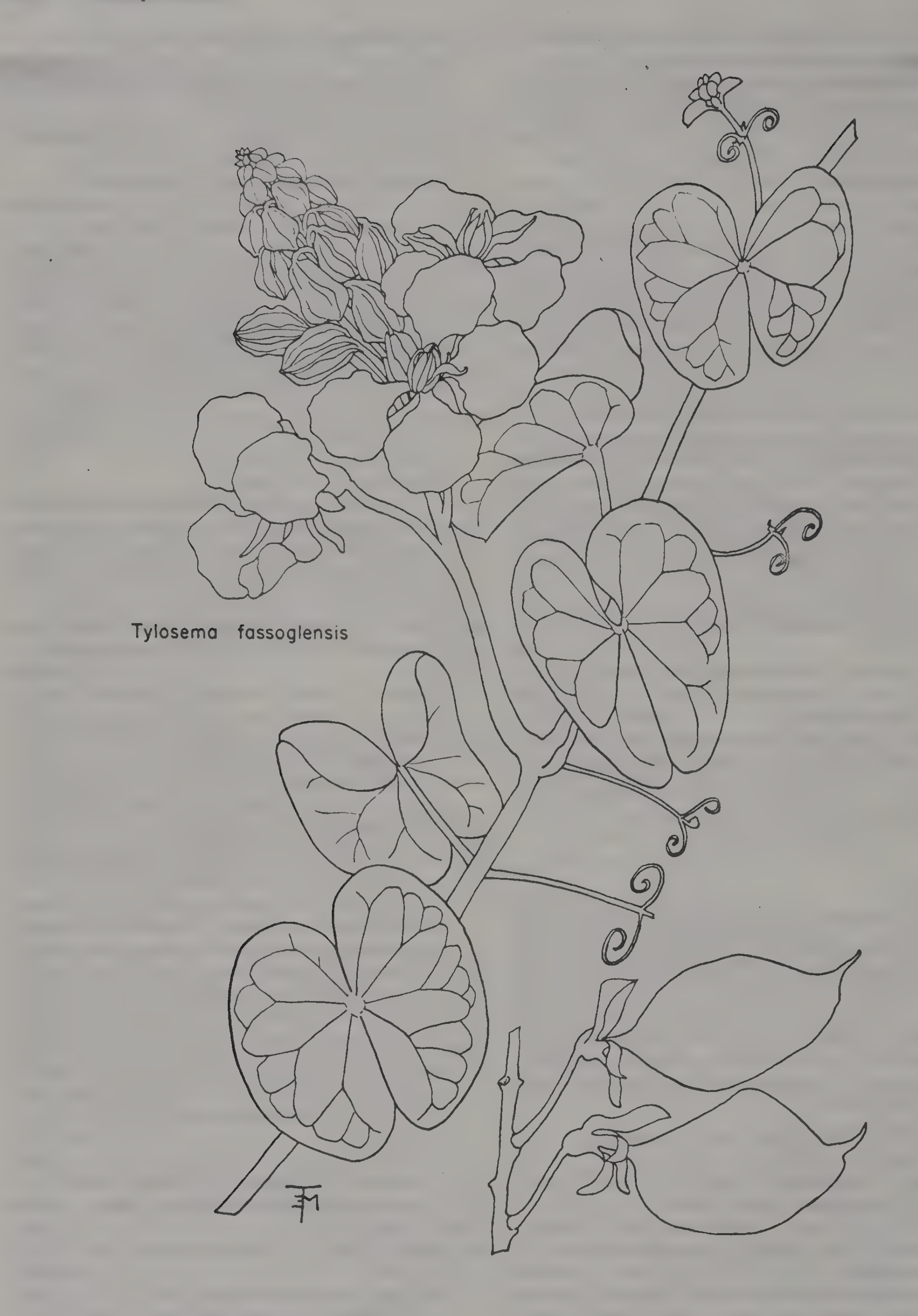
Locally common in hot country where not too dry. HE, HC, KIT, MUM, KIS, NAR, NAN, MAC.

Agnew, Musumba and Kiniaruh 7975; McDonald 914.

2. CASSIA *L.*

Annual or perennial herbs, shrubs, or trees with pinnate leaves, often with conspicuous glands on petiole and rachis; flowers in racemes, usually yellow; sepals 5, free; petals 5, the upper ones smaller; stamens 10, the upper ones sometimes staminodal, dehiscing by terminal pores or slits; pods variable, flat or cylindrical, woody to papery, indehiscent or dehiscent, with or without septa between the seeds.

1 Sepals rounded at apex — 2
  Sepals acute at apex — 7
2 Plant with glandular hairs — 1. *C. absus*
  Plant without glandular hairs — 3
3 Petiole and rachis of leaves with massive multicellular glands; pods straight and ± smooth — 4
  Petiole and rachis of leaves without glands; pods curved and with a longitudinal crest — 2. *C. italica*
4 Gland present on petiole base only — 3. *C. occidentalis*
  Gland present on rachis between leaflets, never on petiole base — 5
5 Leaflets acute at apex — 4. *C. floribunda*
  Leaflets obtuse at apex — 6
6 Pedicels of flowers over 1·5 cm long — 5. *C. obtusifolia*
  Pedicels of flowers under 1·0 cm long — 6. *C. bicapsularis*
7 Rachis of leaves winged between the insertion of the leaflets, so that it appears crenate or dentate once the leaflets fall — 8
  Rachis of leaves unwinged, appearing entire after removal of leaflets — 9
8 Plant perennial from a woody rootstock — 8. *C.* sp. *B*
  Plant annual — 7. *C. mimosoides*
9 Gland on petiole stalked — 10
  Gland on petiole sessile — 13
  (*N.B. Occasional specimens and leaves may be without glands and further searching may reveal them. If not, then both dichotomies of the key must be followed here.*)
10 Midrib of leaflet marginal, with lateral veins on one side only; glands with long stalks — 9. *C. fallacina*
  Midrib of leaflet eccentric but with laterals on both sides; glands shortly stalked — 11
11 Glands on petiole with stalk up to 1·5 times gland diameter; pods to 2·5 cm long; leaves to 2·2 cm long — 10. *C. usambarensis*
  Glands longer-stalked; pods to 4 cm long; leaves up to 4·5 cm long — 12
12 Accessory glands mostly present along rachis; upper leaf surface mostly glabrous; conspicuous vein anastomoses often present along leaflet margins — 11. *C. grantii*
  Accessory glands absent; upper leaf surface densely pubescent or tomentose; anastomoses at margin of leaflets inconspicuous or absent — 15. *C. hildebrandtii*
13 At least some leaflets more than 1·5 cm long; inflorescence subumbellate, of 3–5 flowers with peduncles less than 5 mm, and pedicels less than 5 mm; pods to 2·5 cm long — 16. *C. nigricans*
  Leaflets rarely as long as 1·6 cm, inflorescence racemose or flowers solitary on longer pedicels; pods more than 2·5 cm long — 14
14 Leaflets in 9–18 pairs; pods less than 3·5 cm long — 17. *C. falcinella*
  At least some leaves with more than 20 pairs of leaflets; pods usually more than 3·5 cm long — 15


Tylosema fassoglensis

15 Annual ... 16
Perennial ... 12. *C. parva*
16 Pedicels mostly over 10 mm long; petals usually over 8·5 mm long ... 13. *C. kirkii*
Pedicels mostly under 10 mm long; petals usually under 8·5 mm long ... 14. *C. quarrei*

1. Cassia absus *L.*

An erect glandular pubescent annual with 3–5 asymmetric ovate leaflets to each leaf and small yellow to red flowers; pods flat, papery, dehiscent.
Locally common as a weed of dry country cultivation. HK, MUM, KIS, MAC.
Kokwaro 1803; Napier 2464.

2. Cassia italica *(Mill.) F. W. Andr.*

An erect glabrescent perennial herb or shrub with 4–8 pairs of oblong leaflets to each leaf and racemes of yellow flowers; pods flattened, curved or straight, with a ridge along centre of valve, papery, dehiscent.
The 'senna pods' of herbalists, this species is rare, found in dry bushland. NAR, BAR, MAC.
Knight B 14; Bally 3177.

3. Cassia occidentalis *L.* (see p. 234)

An annual or perennial, often robust, glabrous shrub with 4–7 pairs of ovate, acuminate leaflets to each leaf and short racemes of yellow flowers; pods long, with a raised bony ridge along each edge and constricted between the seeds, dehiscent.
Locally common as a weed of cultivation in the warmer districts. HA, MUM, KIS, BAR, MAC.
Hanid and Kiniaruh 660; Mainwaring 2192.

4. Cassia floribunda *Cav.*

Similar to *C. occidentalis* but with fewer leaflets and indehiscent, cylindrical pods.
Locally common, in cultivation in cleared forest. HT, MUM, KIS, NAR, EMB, MAC, NBI.
Strid 2618; Verdcourt 1481.

5. Cassia obtusifolia *L.*

An erect glabrescent annual with 2–3 pairs of obovate-elliptic leaflets to the leaf and solitary axillary yellow flowers; pod square in cross-section, long, curved, and narrowed towards the apex.
Locally common, as a weed of cultivation in warmer districts. KIT, KIS, MUM, BAR.
Hanid 683; Knight 7.

6. Cassia bicapsularis *L.*

An erect bushy woody glabrous shrub with 2–3 pairs of obovate to oblong leaflets on the leaf and short racemes of yellow flowers; pod cylindrical, indehiscent.
Locally common in disturbed, dry bushland. HE, MUM, KIS, BAR, RV.
Agnew, Musumba, and Kiniaruh 8008; Mwangangi 10.

7. Cassia mimosoides *L.* (see p. 235)

A prostrate or erect mostly pubescent wiry annual with parallel-sided leaves bearing over 30 leaflet-pairs, and solitary yellow flowers; pod flat, dehiscent.
Common in disturbed dry places and open habitats on shallow soil. HC, KIT, KIS, RV, MAG, MAC, NBI, KAJ.
Agnew 9843; Kerfoot 3935.

8. Cassia *sp.* **B.** *of FTEA*

Similar to *C. mimosoides* but with stems from a perennial rootstock.
Only once recorded from Donyo Sabuk. MAC.
Napier 3125.

9. Cassia fallacina *Chiov.*

A prostrate pubescent wiry shrub with tapering leaves bearing 9–27 pairs of very asymmetric leaflets and solitary yellow flowers.
Locally common in disturbed dry grassland. MAG, MAC, NBI.
Agnew 5607; Thomas 324.

10. Cassia usambarensis *Taub.*

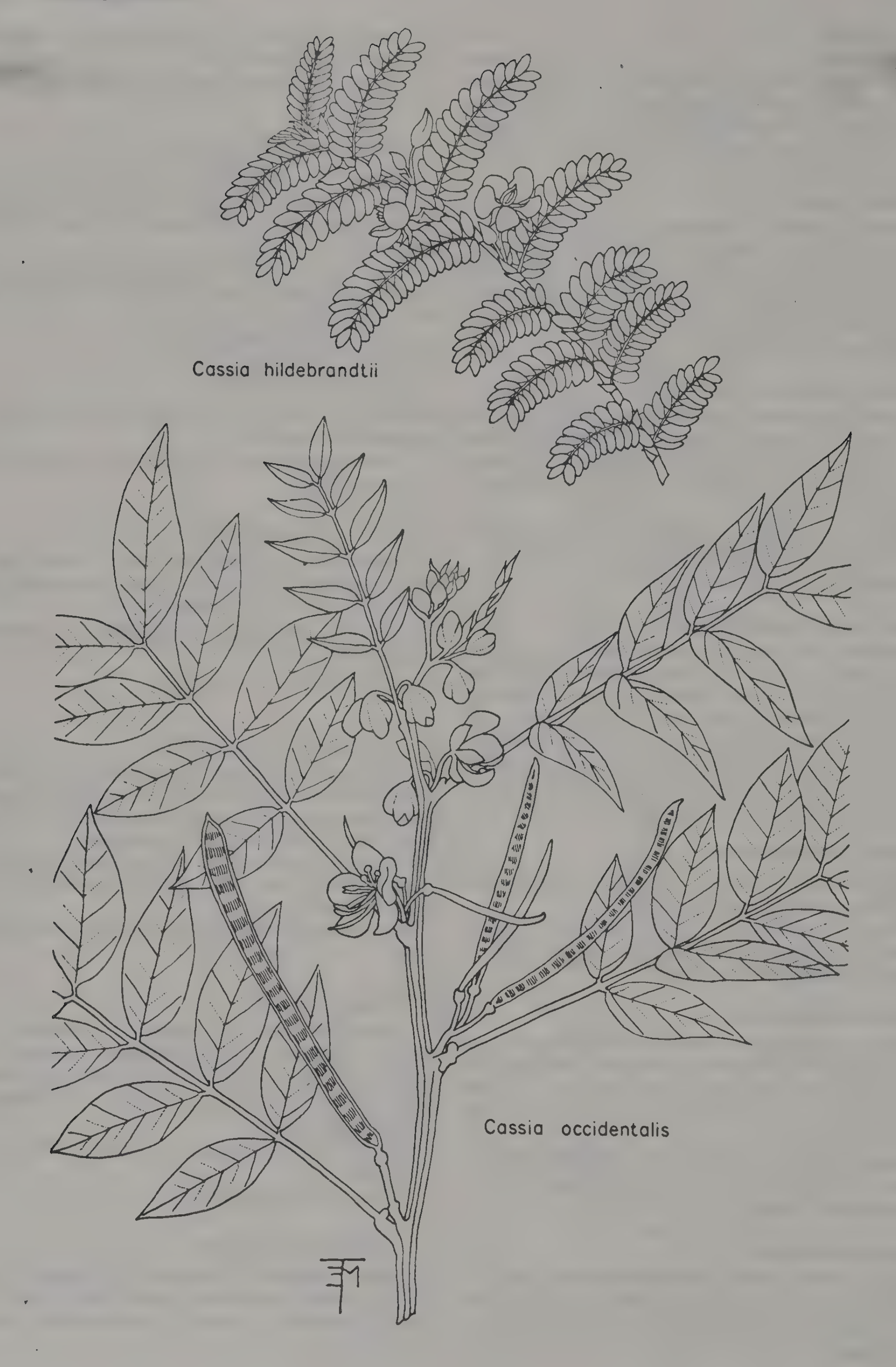
A prostrate, pubescent perennial with annual branches from a thickened rootstock and ovate leaves bearing 5–11 pairs of leaflets; flowers solitary, long-pedicellate, yellow-orange.
Locally common in shallow soils within the upland forest area. HE, HC, HT, HM, HL, HA, KIT, RV, NAN, NBI.
Tweedie 67/130; Glover, Gwynne, and Samuel 790.

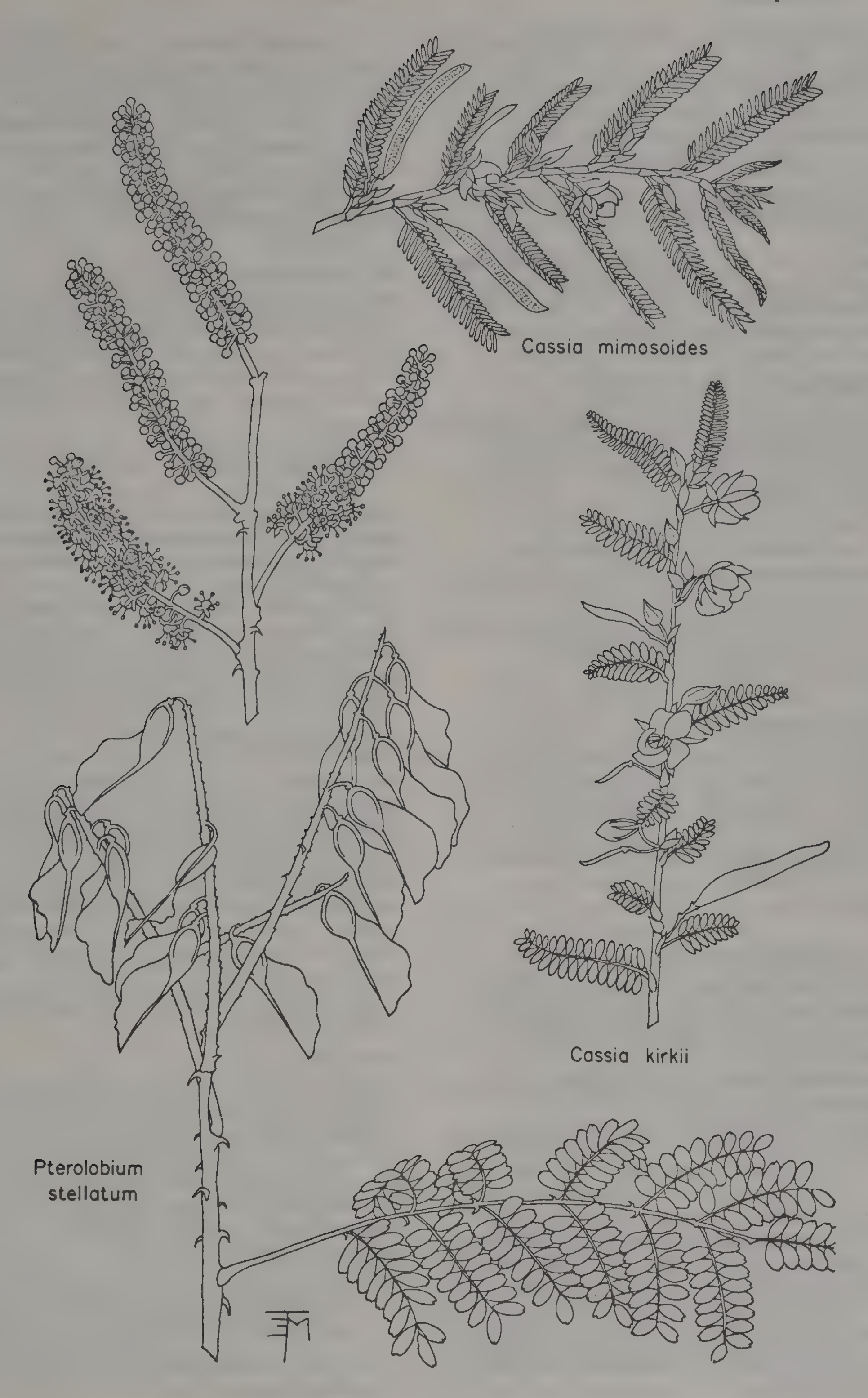
11. Cassia grantii *Oliv.*

A prostrate, sparsely pubescent perennial with annual branches from a woody rootstock and oblong leaves bearing 6–11 pairs of large, oblong, blunt leaflets; flowers yellow; in few-flowered axillary racemes.
Local in dry bushland. HK, NAR, RV, MAC, NBI, KAJ.
Blencowe 33; Bally 543.

12. Cassia parva *Steyaert*

An erect pubescent perennial with annual stems from a woody rootstock; leaves linear, with 8–35 pairs of lanceolate leaflets; flowers yellow, solitary or 2 together.


Cassia hildebrandtii
Cassia occidentalis


Cassia mimosoides
Cassia kirkii
Pterolobium stellatum

Rare plant found in wooded grassland. HC, KAJ.
Tweedie 66/217; Bally 235)

13. Cassia kirkii *Oliv.* (see p. 235)
An erect pubescent annual with long linear-tapering leaves bearing 20–40 narrowly oblong leaflets and clustered yellow flowers at the upper nodes.
Common in tall grassland, especially where seasonally flooded. HE, HM, HA, KIT, MUM, KIS, NAR, MAC, NBI.
Tweedie 67/213; Kerfoot 5040.

14. Cassia quarrei (*Ghesq.*) *Steyaert*
Similar to *C. kirkii* but with prostrate or ascending stems and the key characters as given. HA, KIT.
Rare plant found in disturbed ground. ?HA.
Record from FTEA.

15. Cassia hildebrandtii *Vatke* (see p. 234)
Similar to *C. grantii* but usually much more hairy and with rather more, smaller leaflets.
Locally common in stony grassland at medium altitudes. HA, NAR, RV, MAC, NBI.
Agnew 9409; Napper 1565.

16. Cassia nigricans *Vahl*
An erect pubescent annual herb with oblong leaves bearing 7–15 pairs of oblong leaflets and 3–8-flowered supra-axillary racemes; flowers small, yellow.
Rare plant found in wooded grassland in western Kenya. KIS.
Napier 3450.

17. Cassia falcinella *Oliv.*
An erect or prostrate, pubescent, annual or perennial herb with ovate to elliptic leaves bearing 5–11 pairs of oblong leaflets and solitary yellow flowers.
Uncommon plant found in wooded or bushed grassland. HC, KIT, KAJ.
Agnew, Kibe, and Mathenge 10262; Brodhurst-Hill 50.

3. CAESALPINIA *L.*
Shrubs or climbers, usually prickly, with bipinnate leaves, without glands; flowers zygomorphic, in terminal racemes, usually bisexual; sepals imbricate; petals subequal except the uppermost; stamens 10, all fertile; ovary usually short-stalked; pods usually flat and compressed but variable, usually dehiscent.

1. Caesalpinia volkensii *Harms*
A woody climber with recurved prickles and rather large ovate, acuminate leaflets on the bipinnate leaves; flowers yellow, male and bisexual; pods flat, orbicular to oblong, covered with stiff bristles.
Locally common in lowland forest edges. HM, HA, MUM, KIS, MAC.
Mbonge 22.

4. PTEROLOBIUM *Wight & Arn.*
Prickly climbing shrubs with bipinnate leaves and small stipules; flowers almost regular, in panicles of racemes; sepals with the lowest overlapping all others; petals equal; stamens 10, all fertile; pods 1-seeded, winged on one side and terminally (a samara).

Pterolobium stellatum (*Forsk.*) *Brenan* (see p. 235)
A large trailing shrub with pegged prickles on the woody stems, recurved prickles on the leaves and petioles, and masses of whitish flowers or bright red fruits.
A common and annoying wait-a-bit thorn of drier forest and bushland edges, but not found with *Combretum* or *Commiphora.* HE, HT, HA, HK, KIS, NAR, BAR, RV, NBI, KAJ.
Strid 2397; Glover, Gwynne, and Samuel 2421.

56. MIMOSACEAE†
Trees, shrubs or rarely herbs with pinnate or bipinnate stipulate leaves and racemose or spicate inflorescences of regular, mostly bisexual flowers; sepals 5, usually united below to form a tube, valvate or imbricate; petals 5, valvate, mostly fused below into a tube; stamens 4–10-numerous, free or variously fused; pollen grains frequently compound; fruit a follicle (pod), dehiscent down two sides or indehiscent.
All species are dealt with in KTS except *Mimosa pudica.*

1. MIMOSA *L.*
Herbs or shrubs, often prickly, with bipinnate, often sensitive and motile leaves; flowers bisexual or male, sessile in globose heads (in ours); calyx very small; corolla with 3–6 lobes on a tube; stamens as many as or twice as many as the corolla lobes; pods flat, bristly or prickly (in ours), splitting into 1-seeded segments leaving the margins of the pod entire.

1 Leaves prickly on the petiole and rachis; pods densely bristly all over — 1. *M. pigra*
Leaves without prickles; pods prickly-hairy only on the margins — 2. *M. pudica*

† By A. D. Q. Agnew.

1. Mimosa pigra *L.*

Dealt with in KTS p. 303. MUM, KIS.

2. Mimosa pudica *L.*

A prostrate or straggling woody annual or weak perennial with prickly stems; leaves with 2 pairs of pinnae from close together at the end of a long petiole and thus appearing palmate; flowers in heads, lilac or pink.

A rare introduced weed in our area (originally from South America) which occasionally turns up near towns. HA, NBI, KAJ.

Chauda, February 1967.

57. PAPILIONACEAE†

Herbs, trees, shrubs or climbers, often bearing root nodules of nitrogen-fixing bacteria; leaves stipulate (rarely stipules absent) alternate, simple or palmately or pinnately 1-many foliolate, the leaflets frequently with small stipules (*stipels*) at their junction with the *rachis* or continuation of the petiole; inflorescence racemose or fasciculate, rarely umbellate; bracts and bracteoles often present; flowers zygomorphic, bisexual; sepals 5, often connate into a tube; petals 5, free or loosely joined, the upper (*adaxial* or *posterior*, called the *standard* or *vexillum*) one enclosing the lateral petals (the *wings*) and within these the lower (*anterior*) petals which are often loosely joined together (the *keel*); stamens 9–10, free or the filaments fused into a tube (10) or with one adaxial filament free ((9) + 1); ovary of one carpel with marginal placentation; fruit a modified follicle (a *legume* or *pod*), indehiscent or dehiscent by two longitudinal valves or by transverse articulations; seeds without endosperm.

1 Leaves not present at flowering — 2
Leaves present at flowering — 3
2 Flowers spreading; pod broadened upwards, 3–4 times as long as broad, pubescent — 34. *Rhynchosia pulchra*
Flowers deflexed; pod ovate or elliptic-oblong up to twice as long as broad, covered with long hairs — 35. *Eriosema*
3 Leaves all simple or 1-foliolate — 4
Leaves, or some of them, compound — 9
4 Stipules sheathing, papery, sometimes connate, persistent; fruit narrowly subcylindrical, breaking into several 1-seeded segments; calyx scarious — 15. *Alysicarpus*
Stipules spreading; fruit not breaking into segments; calyx usually herbaceous — 5
5 Anthers alternately long and short; pod inflated — 38. *Crotalaria*
Anthers uniform; pod not inflated — 6
6 Anthers apiculate; hairs, or some of them, attached at their centres — 4. *Indigofera*
Anthers not apiculate; hairs simple or lacking — 7
7 Standard pubescent or silky outside — 3. *Tephrosia*
Standard glabrous — 8
8 Pod with more than 2 seeds — 26. *Vigna*
Pod with 1–2 seeds — 34. *Rhynchosia alluaudii*
9 Leaves digitately 2–11-foliolate, the leaflets all arising from the same point and without any extension of the axis beyond them stipels usually absent — 10
Leaves pinnate, or pinnately trifoliolate (rachis prolonged beyond lateral leaflets), usually stipellate if trifoliolate — 20
10 Leaflets slightly to conspicuously dentate or toothed; stipule base encircling the stem; stipels absent — 11
Leaflets entire; other characters not combined — 12
11 Pod 3–4 times as long as the calyx, 10–15-seeded; peduncle 1–4-flowered — 42. *Parochetus communis*
Pod usually shorter than the calyx, never as much as twice as long, 1–9-seeded; peduncles usually with more than 4 flowers — 41. *Trifolium*
12 Leaflets 2 or 4; stipules and bracts conspicuous, produced below the point of insertion; fruits often bristly — 11. *Zornia*
Leaflets 3, 5 or more; stipules and bracts not so produced; fruits not bristly — 13
13 Leaflets and calyx with sessile rounded resinous glands — 14
Leaflets and calyx without such glands — 15
14 Shrub with fasciculate dense sessile inflorescences; pods bearing red globules of secretion which stain yellow — 36. *Flemingia grahamiana*
Herbs, mostly with paniculate inflorescences; if inflorescences sessile then not agreeing in other characters; pods without secretory globules — 35. *Eriosema vanderystii*
15 Anthers 4–5, basifixed, alternating with 5–6 shorter dorsifixed, or 5 only — 16
Anthers uniform, 10 — 4. *Indigofera cufodontii*
16 Calyx 2-lipped, the lower lip 3-fid — 17
Calyx not 2-lipped, or if slightly so the lower lobes much exceeding the united part — 18
17 Leaflets 5–11; keel beaked — 39. *Lupinus princei*
Leaflets 3; keel obtuse — 40. *Argyrolobium*
18 Stipels present; pod linear, compressed, with

† By J. B. Gillett (Key and Genera 3–7, 26, 41–48), R. Polhill (Key and Genera 38–40), and A. D. Q. Agnew.

an upturned beak, with partitions of endocarp between the seeds; plant trailing or twining 21. *Teramnus*

Stipels lacking; pod variously shaped but if linear without an upturned beak, continuous within; plant never twining 19

19 Keel obtuse; lateral calyx lobes more united with the upper than with the lower lobe which is often narrower; 4 anthers large, 6 anthers small; pods only slightly inflated 37. *Lotononis*

Keel beaked; calyx lobes subequal or the three lower slightly more united or with the upper 2 also slightly united to form 2 lips; 5 large anthers alternating with 5 small ones; pod inflated 38. *Crotalaria*

20 Leaves without a terminal leaflet or with the terminal leaflet much smaller than the rest 22

Leaves terminating in a leaflet as large as or larger than the rest 28

21 Calyx 2-lipped; fruits with 1–28 1-seeded joints which break up easily (in some *Aeschynomene* species only one joint is present which is straight above, strongly rounded below and flattened) 21

Calyx not distinctly 2-lipped; fruits not jointed 27

22 Inflorescences lax, never scorpioid, often few-flowered; pods easily visible, well exserted from the calyx; bracts small 7. *Aeschynomene*

Inflorescences mostly dense and scorpioid, often almost cone-like; pods not visible, folded like a concertina; bracts often large 23

23 Stipules spurred; leaflets opposite with only 1 main nerve; bracts deciduous 8. *Smithia*

Stipules not spurred; leaflets alternate with 2–7 basal nerves; bracts persistent 9. *Kotschya*

24 Herbs, shrubs or climbers without tendrils 25

Herbs, with tendrils on leaves 26

25 Standard without appendages; pods oblong, flattened, less than 3 cm long; seeds often red and black 2. *Abrus*

Standard with appendages; pods cylindrical, over 5 cm long; seeds not red and black 5. *Sesbania*

26 Style pubescent on lower side, or on all sides, or glabrous 50. *Vicia*

Style pubescent on upper side only 51. *Lathyrus*

27 Leaves subsessile, the lowest pair of leaflets sometimes resembling leafy stipules; stipules reduced to gland or absent 28

Leaves petiolate and/or stipulate 29

28 Pod straight, narrowly cylindrical, dehiscent as a whole; leaflets 3–5 45. *Lotus*

Pod curved, composed of spherical, 1-seeded, individually dehiscent segments; leaflets 3–11 46. *Antopetitia abyssinica*

29 Leaves 5–many-foliolate 30

Leaves all or mostly 3-foliolate 40

30 Anthers apiculate; hairs, or some of them, attached at their centres; corolla usually red in part 4. *Indigofera*

Anthers not apiculate; hairs basifixed; corolla never red 31

31 Lower side of leaflets and calyx with rounded, sessile, or shortly stalked glands visible wherever the indumentum is not dense 35. *Eriosema*

Leaflets and calyx without such glands 32

32 Standard over 2·5 cm long, much exceeding the other petals; style hairy above; bracteoles large 18. *Clitoria ternatea*

Standard smaller, hardly exceeding other petals; style glabrous or hairy only at tip; bracteoles small 33

33 Standard pubescent or silky tomentose outside 3. *Tephrosia*

Standard glabrous or with small scattered hairs mostly towards apex and margin 34

34 Shrubs or woody climbers 35

Annual or perennial herbs 37

35 Leaflets mostly opposite; pods inflated 49. *Colutea abyssinica*

Leaflets mostly alternate; pods not inflated 36

36 Leaves mostly in tufts; fruits covered with stiff hairs 6. *Ormocarpum trichocarpum*

Leaves mostly borne separately along the stem; ovaries and fruits glabrous 1. *Dalbergia*

37 Pod of spherical 1-seeded segments; stipules absent 46. *Antopetitia abyssinica*

Pod not segmented; stipules present, conspicuous 38

38 Stipules divided into 2–3 narrow lobes 47. *Galega*

Stipules entire 48. *Astragalus atropilosulus*

39 Leaflets toothed 40

Leaflets entire 41

40 Pod spirally coiled 44. *Medicago*

Pod straight 43. *Melilotus*

41 Calyx truncate with no teeth 17. *Dumasia villosa*

Calyx teeth well developed 42

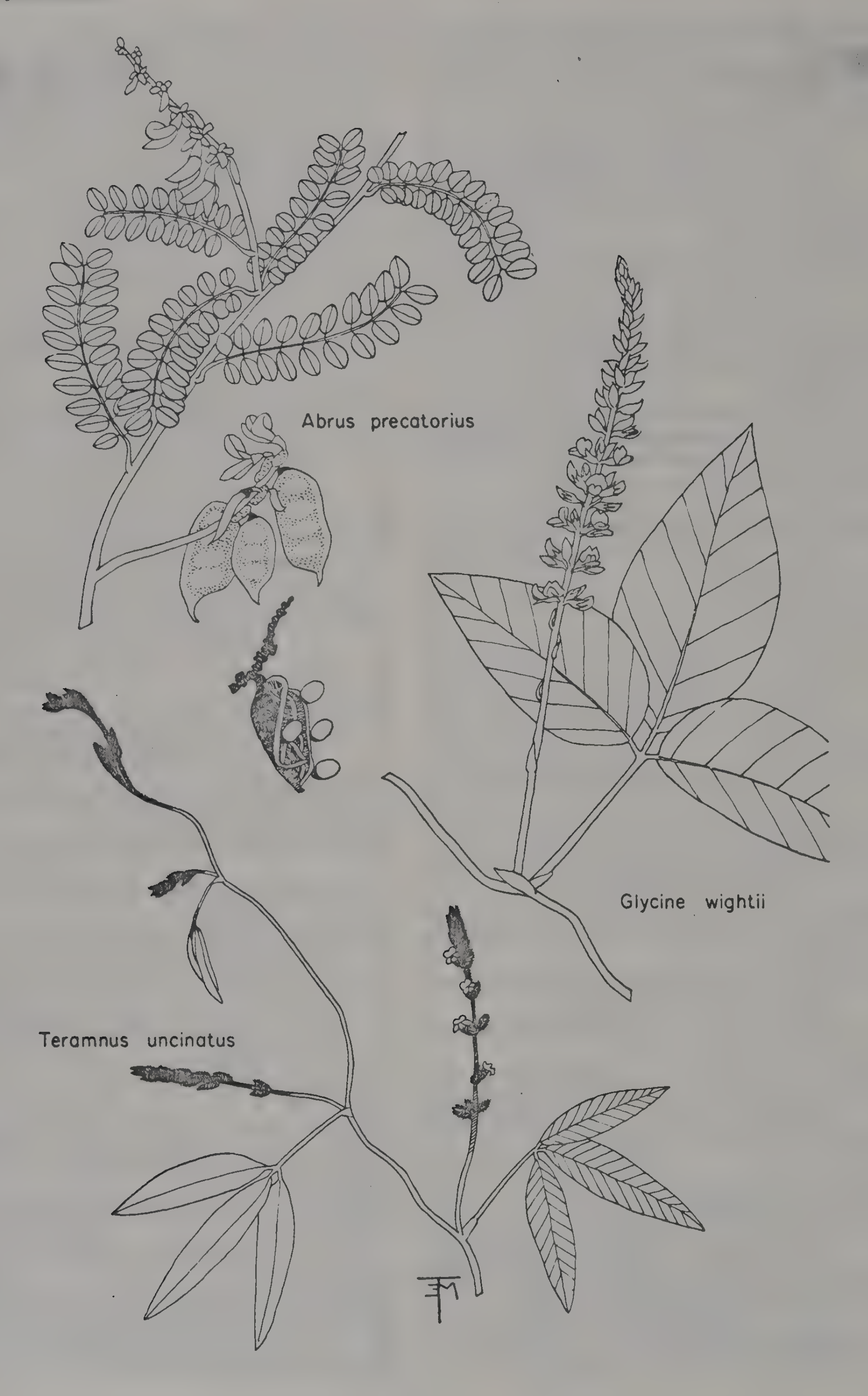
42 Undersides of leaflets and calyx covered with yellow or orange gland-dots (often difficult to see if densely hairy) 43

Undersides of leaflets and calyx without gland-dots 45

43 Ovary 3–8-ovulate; pod grooved between the seeds 33. *Cajanus*
Ovary 2-ovuled; pod not grooved between the seeds 44
44 Funicle (seeds stalk) inserted at centre of a circular hylum; flowers spreading; pod broadened upwards, 3–4 times as long as broad, covered with short, sometimes also with long hairs 34. *Rhynchosia*
Funicle attached at one end of a linear hylum; flowers deflexed; pod ovate, or elliptic oblong, abruptly contracted to a stipe (stalk), up to twice as long as broad, always (in our area) with long hairs 35. *Eriosema*
45 Style flattened and spathulate at tip; standard glabrous 28. *Sphenostylis stenocarpa*
Style apex various but not flattened, or if slightly so then standard hairy outside 46
46 Pods covered with irritant hairs; standard much shorter than other petals 22. *Mucuna*
Pods without irritant hairs, although they may be bristly; standard usually longer than other petals 47
47 Standard hairy outside 48
Standard glabrous outside 50
48 Flowers pink or orange 3. *Tephrosia*
Flowers purple, cream or yellow 49
49 Inflorescences long-pedunculate 26. *Vigna*
Inflorescences sessile at nodes of false racemes 19. *Ophrestia radicosa*
50 Alternate stamens sterile, lacking anthers; pods elongate, linear, distinctly turned up at the apex 21. *Teramnus*
All stamens with anthers; pods without a distinctly upturned beak, or if beaked then very short and never linear 51
51 Fruit dividing into distinct articles, or if only one article then the calyx tube narrow, like a pedicel 52
Fruit not dividing into distinct articles (sometimes transversely furrowed) 53
52 Calyx tube very slender, stalk-like; stamens all fused; stipels absent 10. *Stylosanthes fruticosa*
Calyx tube not so slender; stamens with one free; stipels present 12. *Desmodium*
53 Pods longitudinally 4-winged 24. *Psophocarpus lancifolius*
Pods not longitudinally winged 54
54 Style with reflexed appendage below the stigma 25. *Vatovaea pseudolablab*
Style sometimes produced beyond the stigma but never reflexed as an appendage 55
55 Most pods over 15 cm long with 3 narrow ribs on the upper side 23. *Canavalia*
All pods less than 8 cm long 56
56 Style with a distinct bulging callus at its junction with the ovary 32. *Neorautanenia mitis*
Style without a callus at its junction with the ovary 57
57 Style divided into a thin basal part and a thickened upper part 58
Style either uniformly thick or uniformly thin or tapering but not of two distinct parts 59
58 Style with the apical bristly part thin and needle-like 27. *Spathionema kilimandscharicum*
Style with the apical bristly part thick 26. *Vigna*
59 Style distinctly thickened, conspicuous; standard with appendages inside near base 60
Style not distinctly thickened, often short and inconspicuous; standard mostly without appendages 61
60 Style with a line of hairs near top of inner margin; stigma terminal, without a tuft of radiating hairs 31. *Lablab purpureus*
Style glabrous except for the terminal stigma which has a tuft of spreading hairs 29. *Dolichos*
61 Pod inflated 13. *Pycnospora lutescens*
Pod not inflated 62
62 Erect herbs or shrubs with small reddish-purple or white flowers; standard less than 1 cm long 14. *Pseudarthria*
Climbers or, if erect, then flowers yellow; standard over 1 cm long 63
63 Bracteoles absent; bracts large and persistent 16. *Amphicarpa africana*
Bracteoles present; bracts caducous or inconspicuous 64
64 Corolla greenish yellow, cream or yellow, sometimes marked pink or purple; standard with 2 long linear appendages inside 30. *Macrotyloma*
Corolla purple or white; standard without appendages 20. *Glycine wightii*

1. DALBERGIA *L. f.*

Trees or woody climbers, with imparipinnate, petiolate leaves without stipels; inflorescences terminal and axillary, of diffuse panicles of small yellowish or flushed purple flowers; calyx bell-shaped, shortly 5-lobed; corolla glabrous or with scattered hairs; standard petal without scales; stamens 9–10, all united or with the upper stamen free; anthers small, erect; ovary with an incurved style and small terminal stigma; fruit indehiscent, oblong or linear, broadly-winged around the frequently thickened seed cavity.


Abrus precatorius
Glycine wightii
Teramnus uncinatus

1 Branches with many short shoots, frequently with spines; leaves at the base of inflorescence branches 1. *D. melanoxylon*
Branches of long shoots, without spines and with inflorescences frequently modified into tendrils 2. *D. lactea*

1. Dalbergia melanoxylon *Guill & Perr.*

A tree, dealt with in KTS p. 362. MAC.

2. Dalbergia lactea *Vatke* (see p. 273)

A small tree or climber with branches and peduncles frequently modified into woody hooks and tendrils; leaves with 7–9 leaflets, oblong-elliptic, glabrous or pubescent; panicles on leafy branches, with crowded white, flushed mauve, flowers; pod 10–15 cm long, oblong.

Included here because it is a frequent climber. This is a plant of forest edges, especially riverine forest. HE, HA, HK, KIT, NAN, KAJ.

Elliot 12; Bally 8268.

2. ABRUS *Adans.*

Shrubs or climbers with pinnate leaves and numerous opposite leaflets; stipels minute, filiform; flowers in axillary or terminal racemes; bracts and bracteoles present; calyx almost truncate with 5 short teeth; stamens (9); anthers all similar; ovary subsessile, many-ovuled; style short, incurved, glabrous; stigma capitate; pods linear or oblong, more or less septate; seeds subglobose, usually glossy.

1 Seeds globose, black and red 1. *A. precatorius*
Seeds not black and red, compressed 2
2 Bracts and bracteoles as long as or longer than the calyx 2. *A. canescens*
Bracts and bracteoles much shorter than the calyx 3. *A. schimperi*

1. Abrus precatorius *L.* (see p. 240)

A woody, glabrous or pubescent climber with oblong leaflets and pedunculate spikes of crowded white to pink flowers; pods with a hooked beak, densely hairy.

Locally common in dry or humid bushland. MUM, MAG, MAC.

Bogdan 912

2. Abrus canescens *Bak.*

A silky-hairy climber with oblong leaflets and sessile flowers in head-like fascicles; corolla dark red or purple.

Uncommon plant found along the lakeside in western Kenya. MUM.

Bogdan 237/61.

3. Abrus schimperi *Hochst.*

A loose, erect, glabrescent shrub with oblong leaflets and sessile flowers in sessile lateral spikes along the inflorescence; corolla variable in colour, cream to purple.

Locally common in dry bushland. MAC.

Bally 8248.

3. TEPHROSIA *Pers.*

Annual or, more often, perennial herbs or weak shrubs; hairs simple, often silky; leaves usually imparipinnate, less often unifoliolate or pinnately trifoliolate; stipels absent; leaflets entire, usually narrowed at the base and widest above the middle, the lateral nerves numerous, parallel, running through to form a marginal nerve; flowers usually pink or purple, occasionally orange or white, pedicellate, 2 or more together in the axils of the upper leaves or at the nodes of terminal or leaf-opposed pseudo-racemes, sometimes condensed to pseudo-umbels; bracteoles usually absent; lowest calyx lobe the longest, the upper pair often partly united; standard pubescent or silky outside; vexillar stamen lightly attached to the other 9, widened and often sharply bent a little above the base; intra-staminal disc usually present; ovary 2–22-ovulate, pubescent; pod nearly always several-seeded, linear or oblong, more or less flattened, not truly septate, never glabrous, ending in a beak (the persistent style-base), dehiscent, the valves twisting and scattering the seeds; seeds usually longitudinal (long axis parallel to the pod) sometimes transverse or oblique; funicle short; caruncle almost absent or variously developed.

1 Leaves all simple (1-foliolate) 2
Most leaves compound 3
2 Lateral calyx lobes not above 3 mm long, less than twice as long as tube; seeds longitudinal; caruncle minute 1. *T. hildebrandtii*
Lateral calyx lobe over 3 mm long, more than twice as long as tube; seeds more or less transverse; caruncle large 4. *T. holstii*
3 Flowers in leaf axils only, never in panicles or pseudo-racemes 4
Flowers, or at least many of them, in terminal or leaf-opposed pseudo-racemes or panicles, sometimes also in upper leaf axils 5
4 Pod 5–9-seeded; claw of keel more than half as long as blade; style ribbon-shaped, not twisted, not, or hardly, penicillate, 1·5–2·5 mm long 2. *T. subtriflora*
Pod 10–14-seeded; claw of keel less than a third as long as blade; style tapering, twisted, penicillate, 2·5–3·5 mm long 3. *T. uniflora*


Tephrosia hildebrandtii
Tephrosia elata
Tephrosia interrupta

5 Style glabrous on both sides for most of its length, though often pubescent at the base and penicillate at the tip — 6
Style pubescent, at least on one side, for most or all of its length — 16
6 Leaflets 1–5, the terminal ones 3–7 cm long; seeds more or less transverse — 5. *T. paniculata*
Leaflets more than 5 (at least in the larger leaves), smaller than 6 cm long; seeds longitudinal — 7
7 Calyx tube 3 mm long, about as long as the lower tooth — 6. *T. emeroides*
Calyx tube less than 3 mm long, or if longer then much shorter than the lower tooth — 8
8 Caruncle well-developed, yellowish, clasping one corner of the seed; leaflets linear, up to 4 (–6) mm wide; inconspicuous bracteoles appressed to calyx base — 7. *T. linearis*
Caruncle minute, inconspicuous; leaflets usually broader than above; bracteoles not present at calyx base — 9
9 Hairs on calyx and pod sutures brown or black, or partly so; upper pair of calyx teeth united for at least half their length, not, or hardly, longer than the tube — 10
Hairs on calyx and pod sutures white or yellowish; upper pair of calyx teeth united for less than half their length, often longer than the tube — 11
10 Leaflets not more than 9, seven or more times as long as wide; stems rarely over 30 cm long; inflorescence rarely with more than 8 flowers — 8. *T. athiensis*
Leaflets often more than 9, less than 6 times as long as wide; stems often over 30 cm long; inflorescence often with more than 8 flowers — 9. *T. noctiflora*
11 Pod with appressed or stiffly spreading hairs which are rarely over 0·5 mm long and not dense enough to hide its surface — 12
Pod with a dense felt of hairs which are often over 0·5 mm long, obscuring its surface — 15
12 Distance between centres of adjacent seeds not more than width of pod; inflorescence rarely more than 5–6-flowered — 13
Distance between centres of adjacent seeds greater than width of pod; inflorescences usually more than 6-flowered — 14
13 Leaflets 5–7; standard 9–11 mm long; seeds 9–12 — 10. *T. lortii*
Leaflets 7–13, usually 9–11; standard under 8 mm long; seeds 8–14 — 11. *T. pumila*
14 Pod 4–6-seeded, usually strongly curved — 12. *T. drepanocarpa*
Pod 6–9-seeded, slightly curved — 13. *T. purpurea*
15 Lower calyx lobe usually under 8 mm long; pods slightly curved, spreading, ascending or slightly deflexed, their hairs rarely as much as 1 mm long; seeds up to 7, the distance between their centres more than the width of the pod; style more or less linear, not twisted; stigma not capitate — 14. *T. rhodesica*
Lower calyx lobe 8 mm or more long; pods strongly curved, deflexed, their basal part often parallel to the inflorescence-axis, their hairs often over 1 mm long; seeds 6–12, usually 8 or more, the distance between their centres less than the width of the pod; style twisted, tapering; stigma capitate — 15. *T. villosa*
16 Pod less than 10 mm wide; keel usually glabrous — 17
Pod 10 mm wide or more; keel pubescent near the lower margin — 23. *T. vogelii*
17 Seeds longitudinal or strongly oblique; pod straight or curved slightly upward near the tip — 18
Seeds transverse; pods straight or curved slightly downwards near the tip — 22. *T. nana*
18 Petiole usually more than 2·5 cm long and longer than the rest of the rachis; leaflets 3–11, rarely less than 5 times as long as wide — 16. *T. lurida*
Petiole rarely exceeding 2·5 cm and if so then leaflets usually more than 13 and less than 5 times as long as wide — 19
19 Midrib not impressed above; leaflets rarely truncate or rounded at the base — 20
Midrib impressed above; leaflets truncate or rounded at the base — 21. *T. aequilata*
20 Bracts persistent; leaflets pubescent above — 17. *T. reptans*
Bracts rarely persistent; leaflets usually glabrous above — 21
21 Pseudo-raceme not markedly interrupted, with numerous nodes, the distance between which is less than or little more than the combined length of pedicel and calyx; larger leaflets usually 4 cm or more long — 22
Pseudo-raceme markedly interrupted with fewer nodes, the gaps between them usually greater than the combined length of pedicel and calyx; larger leaflets usually under 4 cm long — 20. *T. interrupta*
22 Peduncle shorter than pseudo-raceme; bracts caducous, narrowly triangular or linear; upper half of style tapering, about 0·2–0·4 mm wide, pubescent on both sides; hairs on pod fulvous, never dark brown or black; caruncle up to 0·7 x 0·2 mm — 18. *T. elata*


Tephrosia pumila
Tephrosia emeroides

Peduncle usually longer than the very dense pseudo-raceme; bracts caducous, lanceolate or ovate-lanceolate; upper half of style linear, about 0·5–0·6 mm wide, pubescent on upper surface and margins only; hairs on pod sometimes dark; caruncle about 1·2 x 0·4 mm 19. *T. nyikensis*

1. Tephrosia hildebrandtii *Vatke* (*T. orientalis* Bak. f.) (see p. 242)

An erect or spreading perennial with 1-foliolate leaves; flowers reddish purple in the upper leaf axils and sometimes also in terminal pseudo-racemes; standard golden-brown, silky outside, 11–14 mm long; style glabrous, linear, not twisted.

In grassland and semi-evergreen bushland, 5000–6000 ft. A hybrid between this species and *T. emeroides* has been found (Gillett 16969). HA, RV, EMB, MAC, NBI, KAJ.

Gillett 16975; Graham 2291.

2. Tephrosia subtriflora *Bak.*

A prostrate or ascending annual or short-lived perennial; leaves with 5–13 leaflets, the terminal usually much longer than the rest; standard white-pubescent outside, 5–8 mm long; style linear, glabrous, not twisted.

A very variable species of *Acacia-Commiphora* open bushland and a weed in the drier cultivated areas up to 4500 ft. MAG, MAC, KAJ.

Milne-Redhead and Taylor 7006; Bogdan 2218.

3. Tephrosia uniflora *Pers.*

A semi-erect, short-lived perennial; leaves with 5–7 leaflets; flowers pink, in pairs in the leaf axils; standard white-pubescent outside, 9–11 mm long; style glabrous, twisted, tapering with a capitate, penicillate stigma.

Acacia-Commiphora bushland and dry grassland, often in rocky places, up to 4750 ft. MAG.

Bally in CM 7130; Faden and Napper 69240.

4. Tephrosia holstii *Taub.* (*T. kassneri* Bak. f.; *T. paniculata* Bak. ssp. *holstii* (Taub.) Brummitt) (see p. 246)

An annual or perennial, yellowish hairy herb with 1-foliolate leaves; flowers orange or brick red in short dense terminal pseudo-racemes, often also in the uppermost leaf axil; standard tomentose outside, 10–13 mm long; style glabrous, curved into a semicircle, penicillate.

Upland grassland and forest margins, 5000–8000 ft. HT, HM, KIT, MUM, EMB, MAC, KAJ.

Brodhurst-Hill 148; Bally in CM 8245.

5. Tephrosia paniculata *Bak.*

An erect annual or short-lived perennial differing from *T. holstii* in the leaves being 3–5-foliolate, the pseudo-racemes longer and the flowers rather larger, the standard up to 15 mm long.

In thicket margins, grassland, and swamps, 3500–7200 ft. HE, MUM, KIS.

Lugard 229; Brodhurst-Hill 512.

6. Tephrosia emeroides *A. Rich.* (see p. 244)

A softly woody, stiffly erect perennial with appressed hairs; leaves with 5–13 leaflets; flowers pink or rose in lax terminal pseudo-racemes and in many of the upper leaf axils; standard with appressed golden hairs outside, about 13 mm long.

In semi-evergreen bushland, 5000–6500 ft. HT, HA, MUM, NAR, RV, NAN, NBI.

Gillett 16976; Glover 3713.

7. Tephrosia linearis (*Willd.*) *Pers.*

A perennial with 5–15 leaflets to each leaf; flowers pink or orange in stiff pedunculate pseudo-racemes of usually 6–10 nodes.

Common in grassland and rocky, bushy slopes, especially in higher rainfall areas, 3000–8000 ft. HT, HM, HA, KIT, MUM, KIS, NAR, RV, EMB, MAC, KAJ. Specimens from EMB and MAC tend to be softer with more spreading indumentum and darker pods and may be varietally distinct.

Tweedie 2465; Verdcourt 3199.

8. Tephrosia athiensis *Bak. f.*

A perennial, with short, often prostrate, shoots from a woody base; leaflets 5–9; flowers pink, in pedunculate pseudo-racemes of 2–12 nodes, never in leaf axils; standard brown-tomentose outside, about 12 mm long.

Locally common in rocky grassland, 5500–9000 ft. Easily confused with *T. lurida*.

Gillett 16834; Nattrass 598.

9. Tephrosia noctiflora *Bak.*

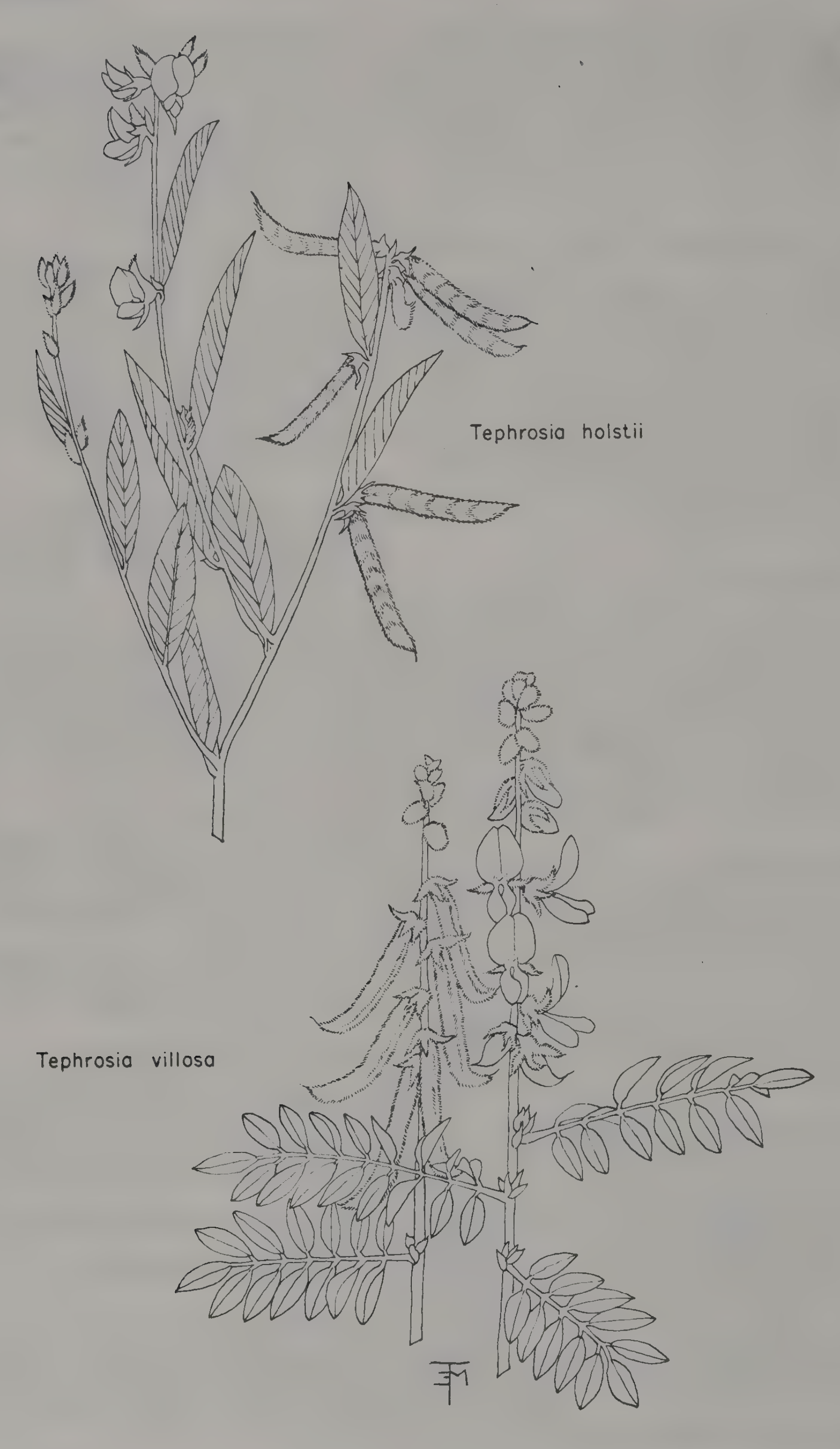
A straggling, short-lived perennial; leaves with 15–25 leaflets; flowers purple, in terminal pseudo-racemes, rarely also in the upper leaf axils; standard densely brown-silky outside, 8–12 mm long.

In *Acacia-Commiphora* bushland up to 4500 ft. MAG, MAC.

Gillett 16168; Thomas 2091.

10. Tephrosia lortii *Bak. f.*

A straggling perennial; leaflets 3–7; flowers purple in short, open, terminal pseudo-racemes and in the upper leaf axils; standard grey-pubescent, about 10 mm long.


Tephrosia holstii
Tephrosia villosa

In *Acacia-Commiphora* bushland at about 3000 ft. MAG.
Verdcourt 2638.

11. Tephrosia pumila (*Lam.*) *Pers.* (see p. 244)

An annual or short-lived perennial resembling *T. lortii* but with 7–13 leaflets and smaller flowers; standard under 8 mm long.

In *Acacia-Commiphora* open bushland, rocky grassland, and a weed in cultivation, up to 6000 ft. It is often confused with *T. purpurea* from which it is distinguished by the more numerous, more closely packed seeds and the sharply down-curved style base. MUM, KIS, BAR, MAC.

Napier 3433; Bogdan 1232 and 5197.

12. Tephrosia drepanocarpa *Bak.*

Closely resembling forms of *T. purpurea* from which it is distinguished by the shorter 4–6-seeded, more sharply curved pod.

Rare plant found in grassland and roadsides, 4750–5250 ft. MAC.

Bogdan 840; Thomas 1012.

13. Tephrosia purpurea (*L.*) *Pers.*

An erect or more often spreading annual or short-lived perennial; leaflets 9–17; flowers reddish-purple or pink in slender, lax, leaf-opposed pseudo-recemes and in the upper leaf axils; standard white-pubescent outside, about 8 mm long.

In *Acacia-Commiphora* bushland and grassland, and as a weed up to 5000 ft. MAC.

Gillett 17196; Bogdan 3089.

14. Tephrosia rhodesica *Bak. f.*

A short-lived perennial; 11–19 leaflets; flowers pink or mauve in rather dense terminal pseudo-racemes and also often in the upper leaf axils; standard tomentose, about 11 mm long.

Rare plant found in our area in open places amongst rocks up to 7000 ft. HL, MUM, MAC.

Bally 3861; Duemmer 1860.

15. Tephrosia villosa (*L.*) *Pers.* (see p. 246)

An annual or short-lived perennial; leaflets 11–15; flowers purple in rather dense terminal pseudo-racemes and also often in the upper leaf axils; standard densely fulvous-tomentose, 11–13 mm long.

In *Acacia-Commiphora* bushland up to 5000 ft. MUM, RV, MAG, MAC.

Kokwaro 110; Glover *et al.* 2835.

16. Tephrosia lurida *Sond.* (*T. dowsonii* Bak. f., *T. longipes* Meisn. var. *lurida* (Sond.) Gillett)

A perennial with a woody rootstock and prostrate or ascending stems; leaflets 3–5, rarely 1–11; flowers mauve-violet in terminal or leaf-opposed pseudo-racemes; standard golden-brown tomentose, 12–14 mm long.

In grassland and open bushland, 4500–7250 ft. HM, HA, MAC, NBI, KAJ.

Greenway 13095; Agnew 5533.

17. Tephrosia reptans *Bak.*

A prostrate or weakly ascending perennial; leaflets 5–19; flowers purple in rather lax terminal or leaf-opposed racemes, usually shorter than the peduncle, never in the leaf axils; standard golden-pubescent, 14–16 mm long.

In open bushland and grassland, especially among rocks, 3000–6000 ft. BAR, RV, MAC.

Bogdan 3363; Gillett 18259.

18. Tephrosia elata *Deflers* (*T. rigida* Bak. non Span., *T. heckmanniana* sensu Cronquist pp. non Harms.) (see p. 242)

A short-lived bushy perennial; leaflets 15–21; flowers pink or purple, numerous in rather dense terminal racemes which are usually longer than the peduncle; standard golden-pubescent, 14–16 mm long.

Grassland, former cultivation and thicket margins up to 6000 ft. HA, KIT, MUM, RV, MAG, EMB, MAC, NBI.

Glover *et al.* 3260; Perdue and Kibuwa 8383.

19. Tephrosia nyikensis *Bak.*

A short-lived perennial differing from *T. elata* in the keyed characters. The inflorescence is sometimes branched.

Uncommon plant found in grassland, vleis, and scrub margins at about 5500 ft. MUM, KIS.

Napier 2882; Royston in CM 17712.

20. Tephrosia interrupta *Engl.* (*T. atroviolacea* Bak. f.) (see p. 242)

A robust bushy woody herb; leaflets 9–21; flowers purple in terminal grey-, brownish- or blackish-tomentose pseudo-racemes with several flowers at each node and short lateral branches sometimes developed with the lower nodes well separated; standard brownish-tomentose 14–20 mm long.

Common in scrub margins and rocky outcrops, 5250–9250 ft. HE, HC, HT, HM, HA, HK, KIT, KIS, NAN, MAC, KAJ.

Gardner 1293; Lugard 43 and 539.

21. Tephrosia aequilata *Bak.*

A softly woody shrub; leaflets 13–21, rounded, truncate or cordate at the base; flowers purple in dense terminal, nearly sessile, subglobose white- or brown-tomentose inflorescences; standard silky, 13–17 mm long.

Rocky scrubland, 6000–7000 ft. HM, MAC.

Gardner 1414; Bogdan 1192.

22. Tephrosia nana *Kotschy & Schweinf.*

An annual or short-lived perennial; leaflets 7–19, larger towards the leaf apex; flowers pink or purple in pedunculate pseudo-racemes which may be short and dense or elongated, rarely a few in upper leaf axils; standard golden-brown silky, 14–16 mm long.

In grassland, fallow cultivation, and swamps up to 6000 ft. MUM, KIS.

Napier 5307; Davidson 263.

23. Tephrosia vogelii *Hook. f.*

A softly woody perennial; leaflets 13–29; flowers white or pale violet in dense terminal shortly pedunculate pseudo-racemes; standard white-silky, about 22 mm long.

Waste ground and former cultivation in high rainfall areas up to 7000 ft. This plant is cultivated as a fish poison and is probably not indigenous to Kenya. HE, HA.

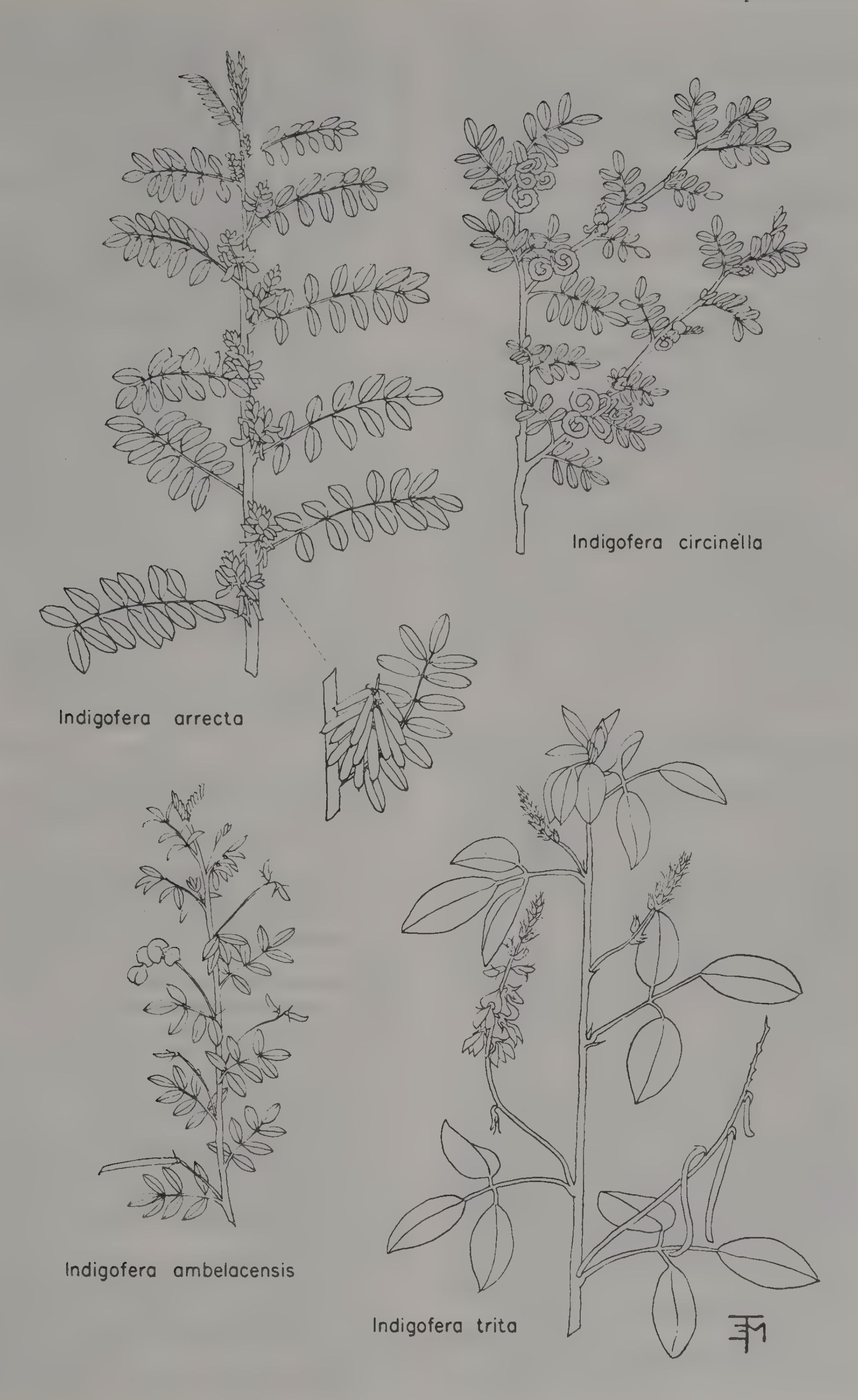
Beckley in CM 6023; Gillett 16270.

4. INDIGOFERA *L.*

Erect or prostrate annual or perennial herbs or, less often, shrubs; hairs typically biramous, rarely simple through the suppression of one arm and in certain species erect multicellular, often glandular, hairs also occur; leaves usually imparipinnate, less often trifoliolate, conjugate, unifoliolate, or simple; stipels often present; flowers usually in axillary racemes, less often single in leaf axils or in panicles; bracteoles absent; corolla usually caducous, less often the standard persistent, usually red or pink at least in part, less than 18 mm long; standard usually pubescent outside, occasionally glabrous, longer than wide, narrowed gradually to the base; claw of wing, if distinct from the blade, less than $\frac{1}{8}$th as long; keel gently curved below, spurred or, less often, merely somewhat pouched on each side; stamens persistent, the dorsal one free, the lower 9 united; anthers dorsifixed, apiculate, usually uniform, less often that on the dorsal stamen missing; pod usually dehiscent 2–many-seeded, rarely 1-seeded by abortion, usually cylindrical, tetragonal, or flattened, rarely as much as 3 mm wide, not inflated, occasionally oblong or oval; endocarp often spotted, forming septa between the seeds.

In the following account the 'width' of a pod is measured from suture to suture, the 'thickness' at right angles to this.

1 Rachis of inflorescence a spine — 13. *I. spinosa*
Rachis of inflorescence unarmed — 2
2 Standard not glabrous outside — 3
Standard glabrous — 43
3 Leaflets opposite — 4
Leaflets alternate — 38
4 Flowers in congested panicles; pod oval, 1- or rarely 2-seeded — 5
Flowers in racemes; pod 2- or more seeded — 6
5 Inflorescence at ends of shoots which are longer than the inflorescence is wide; fruiting calyx 6–8 mm long — 3. *I. capitata*
Inflorescences mostly lateral, sessile in leaf axils or on side shoots shorter than the width of the inflorescence; fruiting calyx *c.* 3 mm long — 4. *I. congesta*
6 Stipules about 6 mm long and 2 mm wide at base; plant a woody white-pilose shrublet *c.* 65 cm tall — 15. *I. thikaensis*
Stipules much smaller — 7
7 Pod flattened — 8
Pod not flattened — 9
8 Bracts caducous; pod curved, 5–9-seeded — 1. *I. hochstetteri*
Bracts persistent; pod short, straight, 1–2-seeded — 2. *I. demissa*
9 Pods erect or ascending — 10
Pods spreading or deflexed — 18
10 Leaf rachis usually prolonged beyond lateral leaflets; filaments up to 6 mm long — 11
Leaf rachis not, or hardly prolonged beyond lateral leaflets; filaments 6 mm or more long — 17
11 Fruiting pedicel over 2 mm long — 5. *I. dendroides*
Fruiting pedicel under 2 mm long — 12
12 Leaflets with a translucent blister at each side and beneath the tip — 6. *I. brevicalyx*
Leaflets without translucent blisters — 13
13 Inflorescence 1-flowered; stamens 2–2·7 mm long — 7. *I. monanthoides*
Inflorescence mostly 2- or more flowered; stamens over 3 mm long — 14
14 Hairs on most young stems spreading — 15
Hairs on young stems appressed — 16
15 Stipules *c.* 2 mm long; margins of young leaflets glandular; pods glabrous or nearly so — 8. *I. tanganyikensis*
Stipules *c.* 4 mm long; margins of leaflets not glandular; pods strigose-puberulent — 9. *I. ambelacensis*
16 Calyx less than half as long as stamens; petiole 1–6 mm long — 10. *I. vohemarensis*


Indigofera circinella
Indigofera arrecta
Indigofera ambelacensis
Indigofera trita

Calyx more than half as long as stamens; petiole 1 mm long, or less — 14. *I. subargentea*

17 Fruiting pedicel rarely over 2 mm, filaments 6–7 mm long; plant usually prostrate — 11. *I. nairobiensis*

Fruiting pedicel up to 8 mm, filaments up to 13 mm long; plant erect — 12. *I. hedyantha*

18 Pods spreading, with or without glandular hairs — 19

Pods deflexed, without glandular hairs — 27

19 Glandular hairs absent — 20

Glandular hairs present, at least on the pods — 21

20 Pod under 2 mm wide, 15–20 mm long, not torulose, the suture *c.* 0·2 mm wide; leaflets appressed strigulose above — 14. *I. subargentea*

Pod 2 mm or more wide, under 15 mm long, often rather torulose, the suture *c.* 0·5 mm wide; leaflets subglabrous or softly and laxly hairy above — 16. *I. vicioides*

21 Biramous hairs all white — 22

Some of the biramous hairs dark brown or black — 23. *I. atriceps*

22 Pod 1–1·8 mm wide, usually over 6 mm long; flowers not held on only one side of the inflorescence — 23

Pod *c.* 2 mm wide, 4–6 mm long; flowers mostly held on only one side of the inflorescence — 22. *I. secundiflora*

23 Petiole usually shorter than basal leaflets; leaves rarely more than 9-foliolate — 17. *I. mimosoides*

Petiole usually longer than basal leaflets; if shorter then leaflets more than 11 — 24

24 Filaments 5–7 mm long — 21. *I. masaiensis*

Filaments up to 4·5 mm long — 25

25 Style 1·2–1·6 mm long, slightly curved, sloping upwards from its somewhat swollen base — 18. *I. colutea*

Style bent sharply upwards through 90° at the centre or near its base — 26

26 Leaflets without glandular hairs, usually more than 3 times as long as wide; glandular hairs on stems usually under 0·6 mm long; filaments 2·3–3 mm long; style 0·7–1 mm long — 20. *I. brachynema*

Leaflets with glandular hairs, not above twice as long as wide; glandular hairs on stems up to 2, 3, or even 4 mm long, on pods up to 1 or 1·2 mm; filaments 3·5–4·5 mm; style 2–3 mm long — 19. *I. zenkeri*

27 Pod glabrous; stamens 8–12 mm long — 24. *I. homblei*

Pod not glabrous; stamens usually shorter — 28

28 Calyx not covered by long stiff spreading hairs, shorter than the stamens which are 3–13 mm long; hairs on standard appressed and parallel giving a shiny appearance — 29

Calyx covered by long stiff spreading hairs, about as long as the 4–5 mm long stamens; standard pubescent not shiny — 37

29 Stamens 11–13 mm long — 25. *I. garckeana*

Stamens under 8 mm long — 30

30 Hairs on fruit mostly dark brown or if admixed with white then dense and somewhat spreading; stamens 4–6 mm long — 31

Hairs on fruit white or if some dark then sparse and closely appressed; stamens up to 4 mm long — 32

31 Raceme almost sessile, shorter than subtending leaf; calyx teeth much shorter than tube; hairs on leaflets closely appressed, not dense enough to hide the surface; pod up to 22 mm long — 26. *I. emarginella*

Raceme pedunculate, usually longer than subtending leaf; calyx teeth about as long as tube; hairs on leaflets often spreading and dense enough to hide the surface; pod up to 35 mm long — 27. *I. swaziensis*

32 Pod more or less tetragonous; leaflets 3–9; calyx more than half as long as stamens — 33

Pod not, or hardly tetragonous; leaflets 5–many; calyx less than half as long as stamens — 35

33 Pod 3·5–4 mm thick; leaflets 7–9 — 28. *I. lupatana*

Pod *c.* 1·5–2 mm thick; leaflets 3–9 — 34

34 Pod curved more or less into a semicircle, or circle; leaf rachis prolonged 0–2 mm beyond lateral leaflets — 29 *I. cliffordiana*

Pod straight or slightly curved but not into a semi-circle; leaf rachis usually prolonged more than 2 mm beyond the lateral leaflets — 30. *I. trita*

35 Pod torulose in plane of sutures, 1–4- or rarely 6-seeded; leaflets 5–9 — 31. *I. bogdanii*

Pod not torulose in plane of sutures or, if somewhat so, then seeds more numerous; leaflets usually 9 or more — 36

36 Pod straight, *c.* 6-seeded, less than 2 cm long; hairs on inflorescence usually more or less brown — 32. *I. arrecta*

Pod curved or almost straight, over 2 cm long, 8–12-seeded; hairs on inflorescence whitish — 33. *I. tinctoria*

37 Petiole often under 4 mm long; peduncle usually longer than rest of inflorescence; seeds minutely dotted; pods *c.* 2 mm wide; hairs on calyx dark brown or black — 34. *I. longibarbata*

Petiole usually over 4 mm long; peduncle

much shorter than rest of inflorescence; seeds coarsely pitted; pods c. 3 mm wide; hairs on calyx whitish 35. *I. astragalina*

38 Leaves 4- or more-foliolate or, if lower leaves with fewer leaflets occur, these do not subtend inflorescences; leaflets rarely over 3 cm long 39

Lower leaves 1-3-foliolate, often subtending inflorescences; leaflets often over 3 cm long 40. *I. conjugata*

39 Pods straight, or almost so 40

Pods curved 42

40 Calyx much less than half as long as corolla, the lobes little longer than the tube; standard densely covered with stiff appressed glistening hairs 36. *I. schimperi*

Calyx at least half as long as corolla, the lobes much longer than the tube; hairs on standard relatively sparse and spreading 41

41 Hairs on stems, peduncles and leaf rachises more or less spreading at the tips; stipules narrow, pilose 37. *I. volkensii*

Hairs on stems, peduncles, etc. all closely appressed; stipules with a wide scarious base glabrescent at the edges 38. *I. spicata*

42 Erect shrublet; leaflets 3-5; pod arcuate or circinate with flattened gaps between the seeds 29. *I. cliffordiana*

Prostrate; leaflets 4-7; pod circinate, not flattened, with seeds close together 39. *I. circinella*

43 Bracts not persistent; fruiting pedicel under 2 mm long; deflexed; all stamens fertile; anthers without basal scales; leaflets 5-15 44

Bracts persistent; fruiting pedicel often over 2 mm long, spreading; dorsal stamen sterile; anthers with basal scales; leaflets 1-13 45

44 Inflorescence pedunculate, longer than the subtending leaf, the peduncle longer than a leaflet 41. *I. costata*

Inflorescence subsessile, shorter than the subtending leaf, the peduncle, if present, shorter than a leaflet 42. *I. parviflora*

45 Leaves all simple, silvery 43. *I. microcharoides*

Leaves, or at least most of them, compound 46

46 Upper leaves digitately trifoliolate with more or less strigulose oblanceolate or obovate leaflets 44. *I. cufodontii*

Leaves pinnate, subglabrous, the leaflets needle-shaped 45. *I. asparagoides*

1. Indigofera hochstetteri *Bak.* (*I. anabaptista* Bak.)

Strigose annual up to 50 cm tall; leaves 3-5-foliolate; rachis 16-40 mm long, of which half is petiole; raceme shortly pedunculate, many-flowered, rather shorter than, or as long as the subtending leaf; calyx 2-3 mm long, deeply divided; stamens c. 3 mm long; pod deflexed, arcuate, flat, 5-9-seeded, about 2·4 mm wide, obtuse except for the persistent style base, appearing jointed because of transverse ridges formed by the septa.

Dry grassland, especially in stony places, and as a weed in cultivated areas up to 5400 ft. BAR, RV, MAC.

Bogdan 3039 and 3856; Bally 4450.

2. Indigofera demissa *Taub.*

Procumbent appressed-strigulose annual, or perhaps sometimes perennial, forming mats; leaves 5-7-foliolate, the rachis 8-15 mm long; raceme very short, almost sessile, 4-8-flowered, the bracts about 1 mm long, persistent; calyx and stamens 1·5-2 mm long; pod 1-2-seeded, 2·5-4 mm long, 2 mm wide.

Disturbed ground, c. 7800 ft. HA.

Nattrass 1285

Note: I. demissa may well have been casually introduced to its one known locality in Kenya, Sasumua dam, which is some 3300 ft higher than any locality known for the species elsewhere.

3. Indigofera capitata *Kotschy*

Erect rather woody branching annual up to 1 m tall; lower leaves c. 11-foliolate, upper 5-7-foliolate; leaflets oblanceolate, up to 2 cm long and 4 mm wide, rachis up to 3 cm long, including a petiole of c. 5 mm, not, or a little, prolonged beyond lateral leaflets; panicles subcapitate, at the ends of the branches, each with an involucre of 2-3 leaf-like outer bracts, inner bracts usually trifid, the segments resembling the calyx lobes; pedicel c. 1 mm long, erect in flower and fruit; calyx silky, divided to the base, the lobes linear-lanceolate; stamens c. 4 mm long.

Stony, grassy places, c. 4000 ft. MUM.

Kimani 168.

4. Indigofera congesta *Bak.*

Erect branching herb up to 1 m tall; leaves 3-7-foliolate, the rachis, including the 8-12 mm petiole, up to 3 cm long; flowers in dense subglobose axillary or terminal panicles; bracts 1-3-foliolate, ending in long stiff points; calyx c. 4 mm long, divided to the base; stamens c. 3·5 mm long; pod 1-, or rarely 2-seeded, c. 2·5 mm long and 1·5 mm wide.

Uncommon plant found in scattered tree grassland with *Combretum*, especially in seasonally waterlogged places, 3300-4500 ft. MUM, EMB.

Bogdan 3753 and 4033.

5. Indigofera dendroides *Jacq.*

Erect, sparsely appressed-strigulose annual up to 1·3 m tall; leaves 11–27-foliolate, the rachis, including the 1 mm petiole, up to 6 cm long; raceme often brownish-strigulose, 8–30-flowered, up to 13 cm long, including a peduncle of up to 5 cm; pedicels *c.* 3 mm long in flower, up to 5 mm in fruit; calyx *c.* 2·5 mm long, divided below the middle into triangular-subulate lobes; stamens 4–5 mm long; pod more or less erect, strigulose, 8–12-seeded, 2–3 cm long, *c.* 1·6 mm wide and thick.

Grassland and cultivated ground, up to 3600 ft. MUM, KIS.

Scott Elliot 7151; Lyne Watt 1546.

6. Indigofera brevicalyx *Bak. f.* (*I. pentaphylla* Auct. non Murr in L.; *I. glabra* Auct. non L.) (see p. 253)

Spreading sparsely appressed-strigulose perennial; leaf rachis, including the 1 mm petiole, up to 15 mm long; leaflets 5–13, each with 3 translucent blisters, one beneath each side and a third beneath the tip; raceme 2–3-flowered, up to 2 cm long; calyx *c.* 1·5 mm long, divided to the middle, each lobe with a blister; stamens 4–5 mm long; pod erect, strigulose, 8–12-seeded, up to 1–8 mm long, *c.* 1·8 mm wide, and 1·2 mm thick.

Short grassland, 4500–7000 ft. HE, HM, HA, KIT, KIS, NAR, RV, MAG, MAC, NBI, KAJ.

Napier 2604; Bogdan 2123.

7. Indigofera monanthoides *Gillett*

Erect annual about 12 cm tall; stipules filiform *c.* 3 mm long; leaflets 3–5, viscid at the margin; flowers solitary on glabrous peduncles 9–11 mm long; calyx 1·5 mm long; stamens 2–2·7 mm long; pod 8–12-seeded, glabrous, erect, 9–12 mm long.

Besides temporary rock pools in *Combretum*, etc. scattered-tree grassland, 5000 ft. MUM.

Brodhurst-Hill 35.

8. Indigofera tanganyikensis *Bak. f*

Stiffly erect herb up to 1 m tall, pubescent with many hairs spreading; leaf rachis, including the *c.* 1 mm petiole, up to 5 cm long, but usually much less; leaflets 7–15, channelled and viscid at the margins; raceme 2–3-flowered, up to 15 mm long; calyx *c.* 1·5 mm long, divided to the middle, the lobes usually gland-tipped; stamens 4–6 mm long; pod usually glabrous 7–10-seeded, 10–20 mm long, *c.* 1·8 mm wide and 1·4 mm thick.

Grassland and bushland, especially on sandy soil and among rocks, 3500–6600 ft. HM, MUM, KIS, NAR, RV, MAC, NBI.

Napper 1604; Bogdan 3384.

9. Indigofera ambelacensis *Schweinf.* (*I. pauciflora* De Wild. non E. & Z.; *I. wildemanii* Bak. f.; *I. conradsii* Bak. f.) (see p. 249)

Erect or spreading pubescent annual up to 80 cm tall; leaf rachis, including a petiole of under 1 mm, up to 2 cm long; stipules *c.* 4 mm long; leaflets 5–11, not viscid; raceme 2–4-flowered, up to 3 cm long; calyx pilose 2–3 mm long, divided below the middle into filiform lobes; stamens *c.* 4 mm long; pod 8–15-seeded, strigose-pubescent, 10–25 mm long, 1·7 mm wide, 1·3 mm thick.

Grassland and bushland, especially among rocks, 3500–5500 ft. KIT, MUM, MAC.

Tallantire 670; Bogdan 1364.

10. Indigofera vohemarensis *Baill.* (*I. pentaphylla* Auct. non Murr in L.; *I. suaveolens* Auct. non Jaub. & Spach; *I. uhehensis* Harms; *I. minimifolia* Chiov.)

Erect branching appressed-strigulose perennial up to 140 cm tall with a tap-root, smelling of coumarin; leaf rachis, including a 1–6 mm petiole, up to 2 cm long; leaflets (3–)5–7(–9); raceme 4–6-flowered, up to 2 cm long; calyx strigose, 1·5 mm long, divided to the middle, lobes triangular; stamens 4–5 mm long; pod appressed-strigulose, 8–14-seeded, 18–25 mm long, *c.* 2 mm wide and 1·7 mm thick.

Grassland and bushland, especially in rocky places, up to 5500 ft. HA, KIT, RV, EMB, MAC.

Bogdan 1549 and 2013.

11. Indigofera nairobiensis *Bak. f.*

Prostrate perennial with woody rootstock, hairs sparse or abundant, appressed or spreading at the tips; leaf rachis, including a 1 mm petiole, up to 15 or rarely 20 mm long, not, or hardly, prolonged beyond lateral leaflets; leaflets 5–11, often with red glandular hairs in their axils; raceme 7–15-flowered, 2–6 cm long; calyx tube 1 mm, lobes 1–3 mm long; stamens 6–7 mm long; pod sparsely strigulose, 6–13-seeded, 15–30 mm long, *c.* 2 mm wide and 1·7 mm thick.

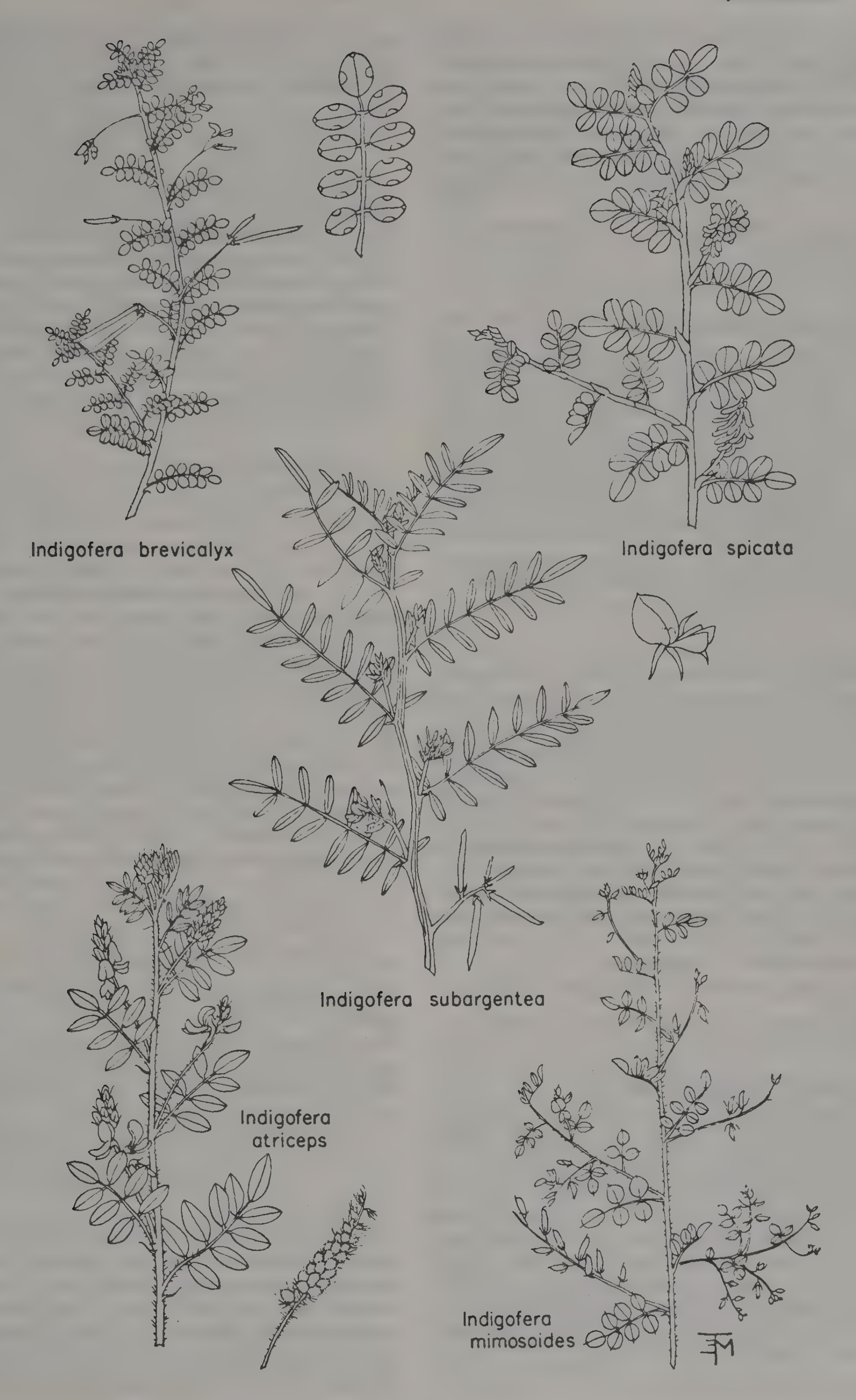
Varies considerably in the density of the indumentum. Specimens collected in KIT and HA and near Thomson's Falls have shorter inflorescences and leaflets with viscid margins and have been described as subspecies *viscida* Gillett.

Grassland and stony places, 5000–6200 ft. HT, HA, HK, KIT, NBI, KAJ.

Bogdan 1608; Bally 7809.

12. Indigofera hedyantha *Eckl. & Zeyh.*

Stiffly erect rather woody herb up to 150 cm tall; leaf rachis, including a 1 mm petiole, up to 15 mm long, not prolonged beyond the lateral leaflets;



Indigofera brevicalyx
Indigofera spicata
Indigofera subargentea
Indigofera atriceps
Indigofera mimosoides

leaflets 7–11; raceme 5–17-flowered, 2–5 cm long, pedicels up to 8 mm long in fruit; calyx densely appressed blackish-strigulose, 3–4 mm long, divided to the middle, lobes triangular, indumentum on standard appressed, golden-brown; stamens 10–13 mm long; pod 7–10-seeded, black-strigulose, up to 4 cm long, *c.* 2·3 mm wide and thick.

Uncommon plant found on mountain slopes near forest margins, 4500–6500 ft. HA, KAJ.

Bally 245; Napier 2173.

13. Indigofera spinosa *Forsk.*

Intricate silvery shrublet up to 50 cm tall; hairs dense, appressed; leaflets 3; petiole 2–4 mm long; raceme with 2–3 flowers borne at, or above, the middle of the 6–25 mm long straw-coloured spinose axis; calyx *c.* 2·5 mm long, divided to the middle, lobes subulate at the tip; standard white-pubescent; stamens 5–6 mm long; pod ascending, strigulose, straight, 6–9-seeded, 15–20 mm long, *c.* 1·8 mm wide and 1·6 mm thick.

Subdesert and dry bushland; up to 3300 or rarely 4200 ft. MAG, MAC.

Bally 292; Bogdan 894.

14. Indigofera subargentea *De Wild.* (see p. 253)

Spreading or erect densely appressed-strigulose annual, with a tap-root, up to 60 cm tall; young stems and leaves of a characteristic yellowish green; leaf rachis, including a 1–2 mm petiole, up to 3 cm long; leaflets 7–17, linear-lanceolate, up to 12 mm long and 2 mm wide; raceme 7–20-flowered, 1–3 cm long, of which the peduncle is less than half; calyx 3–4 mm long, strigose, divided almost to the base into subulate-setaceous lobes; stamens 3–4 mm long; pod erect or spreading, densely strigulose, 7–11-seeded, 15–20 mm long, *c.* 1·8 mm wide and 1·4 mm thick.

Moist type grassland, 5500–6000 ft. HE, KIT, MUM, KIS.

Symes 771; Bogdan 3497.

15. Indigofera thikaensis *Gillett*

Erect woody white-pilose shrublet about 65 cm tall; leaves mostly crowded on short branches; stipules brownish about 6 mm long and up to 2 mm wide at the base; leaf rachis up to 14 mm long; leaflets 5–9, up to 9 mm long and 4 mm wide; racemes 3–12-flowered, 10–20 mm long; bracts lanceolate, up to 6 mm long; calyx 3 mm long; corolla white-pubescent; stamens 5·5 mm long; pods unknown, possibly a sterile hybrid.

Grassland and roadsides, at Thika. HA-MAC boundary, 4900 ft.

Faden 67/606, 67/726.

16. Indigofera vicioides Jaub. & Spach (*I. divaricata* De Wild. non Jacq.; *I. semlikiensis* Robyns & Boutique; *I. rogersii* R. E. Fries)

Spreading annual or perennial; leaf rachis, including a 1–7 mm petiole, up to 5 cm long; leaflets 5–13, elliptic-oblong, up to 15 mm long and 5 mm wide; raceme 5–15-flowered, up to 10 cm long of which the peduncle is about a third; calyx *c.* 2 mm long, deeply divided into subulate lobes; stamens *c.* 3 mm long; pod somewhat torulose with broad (0·5 mm) sutures, 4–8-seeded, 8–17 mm long, *c.* 2 mm wide and 1·8 mm thick.

Varies considerably in the amount of indumentum and whether it is appressed or spreading.

Uncommon plant found in grassland, 3600–5750 ft. KIT, MUM, EMB, MAC, NBI, KAJ.

Maher 1545; Bogdan 3365.

17. Indigofera mimosoides *Bak.* (*I. shirensis* Bak. f.; *I. brevipetiolata* Cronq.) (see p. 253)

Erect or spreading annual or short-lived perennial, up to 1 m tall, branches reddish with white biramous hairs and also weak spreading red, sometimes glandular, multicellular hairs up to 4 mm long, which are also found on the leaf rachis, inflorescence-axis and calyx but not on the leaflets; stipules setaceous-subulate up to 4 mm long; leaf rachis, including a 1–6 mm petiole, up to 25 mm long; leaflets 3–11; racemes lax, 10–30-flowered, up to 5 cm long including the *c.* 1 cm peduncle; calyx *c.* 3 mm long, divided nearly to the base into setaceous lobes; stamens 3–3·5 mm long; pod spreading, 2–5-seeded, sparsely covered with short appressed white biramous hairs as well as with short erect multicellular glandular hairs, up to 10 mm long, *c.* 1·2 mm wide and 1 mm thick.

Grassland, bushland, and forest margins, 5000–7000 ft. HE, HM, KIT, KIS, RV.

Tweedie 874 and 1318; Napier 2863.

18. Indigofera colutea (*Burm. f.*) *Merrill* (*I. viscosa* Lam.)

Erect or spreading annual or short-lived perennial up to 90 cm tall covered not very densely with white appressed or spreading biramous hairs and erect multicellular glandular hairs which are up to 1·2 or rarely 2 or 3 mm long on the stems and up to 0·6 mm on the pods, and also occur on the leaf-rachis, inflorescence-axis and leaflet margins; leaf rachis, including a petiole longer than a basal leaflet, up to 7 cm long; leaflets 9–15, 2–3 times as long as wide; raceme 8–20-flowered, as long as, or shorter than, the subtending leaf, the peduncle up to 8 or 12 mm long, shorter than the rest of the rachis; calyx deeply divided, 2/5–2/3 as long as the 3–4 mm stamens; style 1·2–1·6 mm long, sloping upwards from a somewhat thickened base; pod

spreading, 8–14-seeded, up to 18 or 23 mm long, *c.* 1·8 mm wide and thick.

Grassland and bushland, up to 5500 ft. KIT, MAG, EMB, MAC.

Bogdan 1346 and 2219.

19. Indigofera zenkeri *Bak. f.* (*I. multifoliolata* De Wild.; *I. viscosa* Auct. non Lam.; *I. colutea* sensu Gillett (1958) partly, non (Burm. f.) Merrill)

Differs from *I. colutea* as follows; up to 2 m tall; multicellular hairs up to 2 or even 3 or 4 mm long on the stems and 1 or 1·2 mm on the pod; leaves up to 15- or even 23-foliolate; raceme usually rather longer than subtending leaf; calyx from 1/2–9/10 as long as the 3·5–4·4 mm long stamens, style 2–3 mm long, rather abruptly bent through 90° in the middle, its base not swollen; pod 6–10-seeded, up to 16 or rarely 18 mm long.

Scattered tree grassland, up to 5100 ft. KIT, KIS, NAR, MAC.

Tweedie 2581; Glover *et al.* 1830.

20. Indigofera brachynema *Gillett* (*I. colutea* (Burm. f.) Merrill var. *linearis* Gillett

Differs from *I. colutea* as follows: up to 30 cm tall; multicellular hairs on stems absent or if present under 0·6 mm or rarely up to 1 mm long; those on the leaf rachis up to 0·4 mm long; never present on leaflets; on pod up to 0·3 or rarely 0·7 mm long; leaflets 13–15, 2·6–6 times as long as wide; calyx from 2/3–1 times as long as the 2·3–3 mm stamens; style 0·7–1 mm long, bent up through 90° near the base; pod 12–13-seeded, up to 18 mm long.

Open grassland on seasonally waterlogged black clay, 3000 ft. MAC.

Bogdan 4370.

21. Indigofera masaiensis *Gillett* (*I. colutea* (Burm f.) Merrill var. *grandiflora* Gillett)

Spreading annual or perennial differing from *I. colutea* as follows: leaflets 7–11 or rarely 13; calyx 2/7–3/5 as long as the 5–7 mm stamens; style about 3 mm long, bent through 90° near the middle.

Semidesert and dry, stony grassland, 2000–5500 ft. RV. MAG.

Bally 12642; Gillett 16180.

22. Indigofera secundiflora *Poir*

Stout erect annual up to 130 cm tall; stems covered both with rather spreading white biramous hairs and erect red, up to 5 mm long, multicellular hairs; leaf rachis, including the 10–15 mm petiole, up to 5 cm long; leaflets 11–15; raceme dense, many-flowered, including the 2–2·5 cm peduncle up to 8 cm long, the flowers all turned to one side ('secund'); calyx setose, *c.* 4 mm long; stamens *c.* 3·5 mm long; pod oval-oblong, 2-seeded, densely covered with short white biramous hairs and short erect multicellular hairs, *c.* 4 mm long, 2·4 mm wide, and 2 mm thick.

Scattered tree grassland, *c.* 3600 ft. MUM, EMB.

Scott Elliot 7115; Bogdan 4847.

23. Indigofera atriceps *Hook. f.* (*I. alboglandulosa* Engl.; *I. setosissima* Harms; *I. kaessneri* Bak. f.) (see p. 253)

Coarse branching sub-erect herb up to 2 m tall, strigose with many of the biramous hairs dark or black, except those on the leaflets; pale or reddish glandular multicellular hairs always present on the pods and usually also elsewhere; leaf rachis 1–6 cm long including a 1–13 mm petiole; leaflets 9–13, elliptical; racemes many-flowered, dense, pedunculate; calyx deeply divided, the lobes subulate-setaceous; standard dark-strigose; stamens 3–6 mm long; ovary shorter than the style; pod up to 10 mm long, 3–8-seeded, about 2 mm wide and thick.

Very variable: three subspecies may, with some difficulty, be distinguished in our area; ssp. *atriceps*, with appressed biramous hairs, and stamens 5 mm or more long, about 30 percent longer than calyx, reaches the highest altitudes; ssp. *setosissima* differing with stamens under 5 mm long and shorter pods, and ssp. *kaessneri* with spreading biramous hairs and stamens *c.* 4 mm long, hardly exceeding the calyx.

Moist type grassland, in bracken and at the edge of montane forest, 3600–8100 ft. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, RV, EMB, MAC, KAJ.

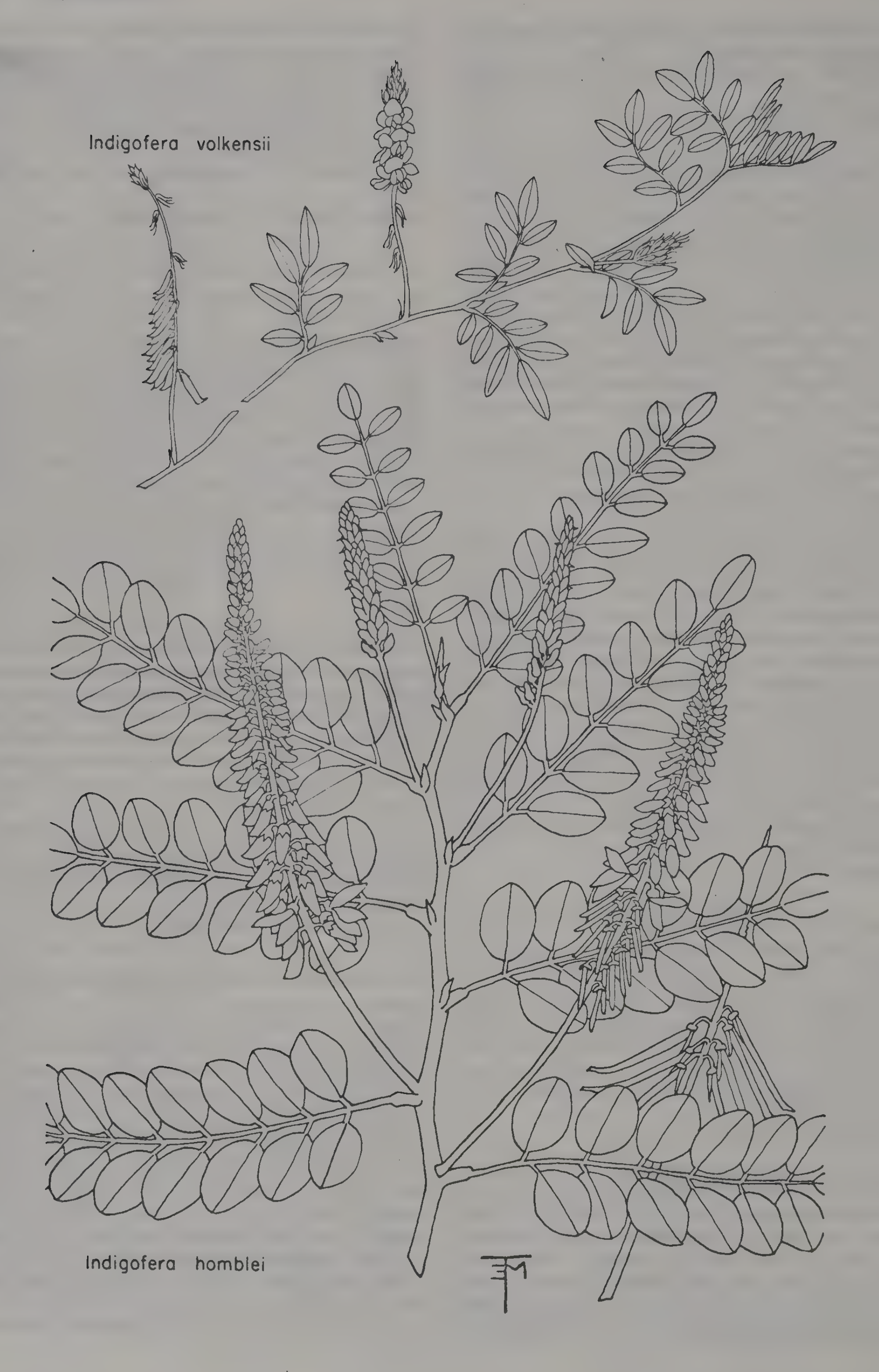
Irwin 100; McDonald 1085.

24. Indigofera homblei *Bak. f. & Martin* (see p. 256)

Softly woody shrub up to 2·5 m tall, stems 3-angled or winged; leaf rachis up to 14 cm long, including a petiole of *c.* 2 cm; leaflets 11–17(–19), elliptic-oblong, up to 45 mm long and 20 mm wide; raceme many-flowered, brown-strigulose, up to 16 cm long, including a peduncle of up to 6 cm; pedicels *c.* 2 mm long in flower, up to 4 or 5 mm and reflexed in fruit; calyx densely brown-strigulose, 1·5 mm long, the lobes triangular, shorter than the tube; stamens, in our area, 8–12 mm long; pod glabrous, reflexed, 6–8-seeded, up to 4·5 cm long, *c.* 3 mm wide and thick.

Scattered-tree grassland and forest edges, 4900–7800 ft. HE, HC, HA, KIT.

Bogdan 242 and 4276; Brodhurst-Hill 566.


Indigofera volkensii
Indigofera homblei

25. Indigofera garckeana *Vatke* (KTS p. 366) (*I. tetragona* Lebrun & Taton)

Closely resembles *I. homblei*; differs in having fewer (5–9, or rarely –13) leaflets, slightly longer flowers (stamens 12–13 mm), strigulose pods, and pedicels rarely exceeding 3 mm even in fruit.

Scattered-tree grassland and forest margins, 3000–6750 ft. HC, KIS, EMB, MAC, KAJ.

Napier 3419; Graham 2113.

26. Indigofera emarginella *A. Rich.* (KTS p. 336)

Softly woody shrub up to 2 m tall; leaflets (5–)7–11, up to 2 cm long and 16 mm wide; racemes densely blackish or brownish strigulose, almost sessile, much shorter than the subtending leaf; calyx *c.* 1·5 mm long, the lobes broadly triangular, shorter than the tube; stamens 5–6 mm long; pod 15–22 mm long, *c.* 2 mm wide and 1·9 mm thick.

Grassland with *Combretum* etc., 4900–6300 ft. KIT, MUM, KIS, EMB.

Bogdan 3500; Verdcourt 3213.

27. Indigofera swaziensis *Bolus* (KTS p. 367) (*I. mearnsii* Standley; *I. oliveri* Harms)

Softly woody shrub up to 3 m tall; leaflets 9–15; raceme usually longer than subtending leaf including a 3–4 cm peduncle; calyx lobes pointed, as long as the tube; stamens 4–6 mm long; pod up to 35 mm long.

Scrub and forest margins, 3600–7200 ft. HM, HA, HK, KIS, NAR, NAN, MAC, NBI.

Bogdan 2453; Napier 454.

28. Indigofera lupatana *Bak. f.* (KTS p. 366) (*I. goniocarpa* Bak. f.; *I. commiphoroides* Chiov.)

Woody herb up to 2·5 m tall; leaflets (5–)7–9(–11), up to 20 mm long and 12 mm wide; raceme many-flowered, sessile or shortly pedunculate, 1–13 cm long; calyx 2·5 mm long, the lobes triangular-acuminate, twice as long as tube; stamens *c.* 3 mm long; pod markedly tetragonal, 3–4 cm long, *c.* 3·5 mm wide and 4 mm thick.

Bushland, especially in rocky places, 2550–4950 ft. MAG, EMB, MAC, KAJ.

Thomas 1073; Verdcourt and Napper 217.

29. Indigofera cliffordiana *Gillett*

Silvery shrublet *c.* 50 cm tall; leaflets usually 3, *c.* 12 mm long and 7 mm wide; raceme 10–20-flowered, up to 6 cm long including a peduncle of up to 2 cm; calyx *c.* 2·5 mm long, the lobes triangular-acuminate, rather longer than the tube; stamens *c.* 4 mm long; pod arcuate or circinate, with flattened gaps between the 4–8 seeds, up to 3 cm long; 1·8 mm wide, and 1·4 mm thick.

Semidesert, *c.* 3100 ft. MAG.

Verdcourt 2758; Bogdan 3470.

30. Indigofera trita *L. f.* (*I. subulata* Poir.; *I. carinata* De Wild.; *I. scabra* Roth; *I. retroflexa* Baill.) (see p. 249)

Somewhat woody herb 1–2 m tall when erect but when subscandent among bushes reaching 5 m; indumentum white; leaflets 3 (var. *subulata*) or 5–9 (var. *scabra*), up to 3 cm long and 17 mm wide; racemes many-flowered, up to 27 cm long, including a peduncle of up to 3 cm; calyx 2·5–5 mm long, the lobes subulate-setaceous, much longer than the tube; stamens *c.* 4 mm long; pod more or less tetragonal, straight or gently curved, 2–2·5 cm long, *c.* 1·3 mm wide, and 2 mm thick.

Grassland, bushland, and forest margins, up to 5400 ft. HA, KIS, MAC, NBI, KAJ.

Bogdan 2442; Napier 449.

31. Indigofera bogdanii *Gillett*

Intricate appressed-strigulose shrublet up to 50 cm tall; leaf rachis 10–15 mm long; leaflets 5–9, up to 5 mm long and 3 mm wide; raceme 10–12-flowered, sessile, *c.* 10 mm long; calyx *c.* 1·5 mm long, the broadly triangular lobes shorter than the tube; stamens *c.* 4 mm long; pod 1–4(–6)-seeded, indehiscent, straight or slightly curved, up to 12 mm long, strongly torulose.

Rocky and saline places, dry grassland especially where overgrazed from 4500–6600 ft. What appear to be hybrids between *I. bogdanii* and *I. arrecta* occur. e.g. Gillett 18626. KIT, RV, NAN.

Drummond and Hemsley 4434; Napper 837.

32. Indigofera arrecta *A. Rich.* (KTS p. 366) (see p. 249)

Stout rather woody herb, 1–2 or rarely 3 m tall; leaf rachis up to 6 cm long, including a petiole of up to 15 mm; leaflets 7–17, up to 20 mm long and 7 mm wide; racemes many-flowered, sessile, up to 5 cm long, but usually much shorter; calyx brown-strigulose, *c.* 1·5 mm long, the lobes triangular, as long as the tube; stamens 3–4 mm long; pod brown, straight, 4–8-seeded, 12–17 mm long; *c.* 2·2 mm wide and 2·8 mm thick. Variable; high altitude forms have rather larger flowers and a greater proportion of brown or black hairs than those found at lower altitudes.

Grassland, bushland, and forest margins, up to 8100 ft. HE, HM, HA, HK, KIT, MUM, KIS, NAR, RV, MAG, EMB, MAC, NBI.

Kerfoot 1895; Napier 2432.

33. Indigofera tinctoria *L.*

Resembles *I. arrecta*, but the indumentum throughout is white, the stamens 4–5 mm long and the pod 8–12-seeded, often somewhat curved, up to 35 mm long and *c.* 2 mm wide and thick.

Alluvial ground near Lake Baringo, 3100 ft. BAR.

Bogdan 4107.

34. Indigofera longibarbata *Engl.*

Slightly woody annual, up to 1·3 m tall; leaf rachis up to 5 cm long, including a petiole of 2–6 mm; leaflets 9–13, up to 2 cm long and 1 cm wide; racemes stiffly dark brown-pilose, dense, many-flowered, up to 25 cm long, of which the peduncle is more than half; calyx stiffly brown- or black-pilose, *c.* 5 mm long, divided almost to the base into setaceous lobes; stamens *c.* 5 mm long; pod stiffly black-pilose, *c.* 3-seeded, up to 8 mm long, *c.* 1·8 mm long, *c.* 1·8 mm wide and 2 mm thick.

Moist grassland and forest margins, 4500–7200 ft. HE, HT, HM, HA, KIT, KIS, KAJ.

Brodhurst-Hill 260; Bogdan 3496.

35. Indigofera astragalina *DC.*

Stiffly brownish- or white-pilose spreading annual, up to 60 cm tall; leaf rachis up to 8 cm long, including a petiole of up to 2 cm; leaflets 3–9, up to 35 mm long and 16 mm wide; racemes dense, many-flowered, up to 12 cm long, including a peduncle of 2–25 mm; calyx and stamens *c.* 4 mm long; pod up to 6-seeded, 15–20 mm long, *c.* 3 mm wide and 3–4 mm thick.

Wooded grassland north of Kitale, 4500 ft. BAR.

Bogdan 3410; Tweedie 2894.

36. Indigofera schimperi *Jaub. & Spach* (*I. tettensis* Klotzsch; *I. baukeana* Vatke; *I. oblongifolia* Auct. non Forsk.)

Perennial with dense appressed silvery indumentum, *c.* 1 m or, rarely, up to 3 m tall; leaf rachis up to 6 cm long, including a petiole of *c.* 3 mm; leaflets 5–10, alternate, up to 25 mm long and 20 mm wide; raceme many-flowered, up to 20 cm long, including a peduncle of 1–2 cm; calyx 2–3 mm long with triangular lobes 1–2 times as long as the tube; standard glistening with a dense appressed silver or yellowish indumentum; stamens 5–7 mm long (var. *schimperi*) or 7–10 mm (var. *baukeana*); pod up to 12-seeded, up to 28 mm long, *c.* 2 mm wide and thick, usually bent abruptly outwards at the base in var. *baukeana.*

Grassland and bushland, often in areas with impeded drainage, up to 6300 ft. HM, HA, NAR, EMB, MAC, NBI, KAJ.

Napier 575; Verdcourt 2510.

37. Indigofera volkensii *Taub.* (*I. phillipsiae* sensu Bak. F. (1926) partly, non Bak. f. *I. subhirtella* Chiov.; *I. boranensis* Chiov.) (see p. 256)

Spreading perennial up to 40 cm tall with a white, rather dense, somewhat spreading indumentum; leaf rachis up to 25 mm long, including a 1–5 mm petiole; leaflets 3–7, the terminal usually much larger than the lateral; racemes many-flowered, up to 7 cm long including a 10–15 mm peduncle; calyx *c.* 4 mm long, divided nearly to the base into setaceous lobes; stamens *c.* 4 mm long; pod straight, rather tetragonal, 5–8-seeded, up to 15 mm long, *c.* 2 mm wide and thick.

Acacia-Commiphora bushland and grassland, up to 5700 ft. NAR, BAR, RV, MAG, NAN, MAC, NBI, KAJ.

Bogdan 2036; Edwards 98.

38. Indigofera spicata *Forsk.* (*I. hendecaphylla* (*endecaphylla*) Jacq.; *I. parvula* Auct. non Del.) (see p. 253)

Prostrate or ascending perennial; indumentum sparse, appressed; stems ridged, more or less flattened; stipules broad and scarious at the base with subglabrous margins; leaf rachis up to 3 cm long, including a 1–3 mm petiole; leaflets 5–11 varying from 3 to 30 mm in length; raceme dense, many-flowered, the fertile part at least twice as long as the 1–4 cm long peduncle; calyx 2–3 mm long, divided almost to the base; stamens *c.* 3·5 mm long; pod straight, or almost so, often torulose when immature, 5–8-seeded, 11–18 mm long, *c.* 1·7 mm wide, and 2 mm thick.

Grassland, especially in disturbed areas, up to 7500 ft. HE, HT, HM, HA, KIT, MUM, KIS, NAR, RV, EMB, MAC, NBI, KAJ.

Bogdan 2865; Brodhurst-hill 125.

39. Indigofera circinella *Bak. f.* (*I. spirocarpa* Harms) (see p. 249)

Procumbent perennial differing from small-leaved forms of *I. spicata* in the brown, subtorulose, spirally coiled, almost indehiscent fruits, the almost sessile inflorescence up to 15 mm long and the 2·5–3 mm long calyx and stamens.

Grassland, especially on shallow soil, 3500–6300 ft. HM, HA, KIT, MUM, KIS, NAR, BAR, MAC.

Gillett 16183; Greenway 8784.

40. Indigofera conjugata *Bak.*

Perennial with a stout woody rootstock and appressed indumentum; leaf rachis up to 4 cm long, including a petiole of up to 1 cm; leaflets 1–3 in lower leaves, up to 8 in upper leaves, glabrous above, except at the margin, up to 6 cm long and 12 mm wide; raceme many-flowered, up

to 12 cm long, including a 0·5–2 cm peduncle; calyx divided almost to the base, *c.* 4 mm long; stamens 3–4 mm long; pod straight, brown, 5–8-seeded, 12–20 mm long, *c.* 2 mm wide, and 1·3 mm thick.

Wooded grassland, 3600–5700 ft. KIT, MUM.
Bogdan 3683; Carroll H4.

41. Indigofera costata *Guill. & Perr.* (*Indigastrum macrostachyum* Jaub. & Spach; *Indigofera goniodes* Bak.)

Appressed strigulose annual *c.* 60 cm tall; leaf rachis up to 6 cm long, including a petiole of 2–4 mm; leaflets 9–15, glabrous above; raceme many-flowered, up to 20 cm long, including a peduncle of up to 5 cm; calyx 2–3 mm, the triangular teeth about as long as the tube, except the lowest, which is longer; corolla very pointed in the bud; stamens *c.* 4 mm long; pod slightly upturned at the tip, up to 4 cm long, *c.* 2·5 mm wide and 1·8 mm thick.

Grassland and bushland, up to 5700 ft. RV, MAG, MAC, NBI.
Verdcourt 3260; Thomas 1004.

42. Indigofera parviflora *Wight & Arn.* (*I. deflexa* A. Rich.)

Differs from *I. costata* in the inflorescence, which rarely exceeds 3 cm in length and is sessile or with a peduncle shorter than a leaflet, in the stamens *c.* 3 mm long and the pod *c.* 2 mm wide.

Acacia grassland, especially on black cotton soil, 3600–4500 ft. KIS, MAC, NBI.
Napier 6779; Bogdan 3076.

43. Indigofera microcharoides *Taub.* (*Rhynchotropis curtisiae* Johnst.)

Perennial, up to 50 cm tall; indumentum copious, white, stiff, rather spreading; leaf simple, up to 4 cm long and 2 cm wide; petiole *c.* 1 mm long; raceme 15–30-flowered, up to 12 cm long, including a 1–2 cm peduncle; bracts persistent *c.* 2 mm long; pedicels up to 7 mm long in fruit, spreading stiffly more or less at right angles to the axis; calyx nearly 4 mm long, the lobes narrowly triangular, longer than the tube; stamens about as long as calyx, the dorsal one sterile; anthers with translucent papery appendages at the base; pod often held parallel to the rachis, i.e. at right angles to the pedicel, *c.* 20-seeded, 3·5–5 cm long, *c.* 2 mm wide and 1·4 mm thick.

Subdesert, dry grassland, and bushland, 3000–6300 ft. NAR, RV, MAG, KAJ.
Verdcourt 2627; Glover *et al.* 1653.

44. Indigofera cufodontii *Chiov.*

Differs from *I. microcharoides* in the leaves which are digitately 3-foliolate and have a petiole up to 5 mm long.

Combretum etc. wooded grassland, 4000–5500 ft. HA, MAC.
Verdcourt 483; Bogdan 2859.

45. Indigofera asparagoides *Bak.*

Almost glabrous perennial; leaflets 5–13, more or less cylindrical, needle-like; raceme 2–10-flowered, up to 10 cm long including a peduncle up to 5 cm; bracts *c.* 1 mm long; pedicels up to 5 mm long; calyx *c.* 2 mm long, divided to the middle; stamens 2–3 mm long; pod 8–14-seeded, 12–25 mm long, *c.* 1·7 mm wide, and 1 mm thick.

Open, rocky places, 5700 ft. KIS.
Buxton in C. Mus. 6033.

5. SESBANIA *Adans.*

Erect herbs or softly woody short-lived shrubs or small trees, often producing a gummy juice when cut; hairs simple; stipules never spurred nor deeply lobed at the base; leaves abruptly pinnate with 4–many pairs of oblong entire leaflets; flowers in axillary 1–many-flowered racemes, bracts and bracteoles present but often very caducous; calyx bell-shaped, the teeth more or less equal, shorter than the tube; corolla glabrous, yellow, the standard often streaked and mottled with purple, with 2 vertical appendages at the base of the blade; wings transversely ribbed; dorsal stamen free, bent sharply near the base where it may be gripped between the appendages of the standard; 9 ventral filaments united for most of their length; anthers all alike; ovary and style usually glabrous; stigma small, globose or ovoid; pod long, narrow, dehiscent, rostrate, transversely septate, 8–50-seeded; seeds usually ellipsoid, the hilum circular or broadly elliptic at or near the centre of one side, often surrounded by a narrow white ring.

Found in places which are wet at least during the rains. In the Kenya uplands different species have not yet been seen growing together.

1 Appendages at base of standard with free tips 2 (or more) mm long; the blade about as wide as long, or wider, widest at or below the middle; pod elliptic in cross-section, the septa 4–6 mm apart; rachis of leaf and raceme not aculeate, except sometimes in *S. dummeri* — 2
Appendages at base of standard without free tips or with free tips under 2 mm long; rachis of leaf and raceme usually more or less aculeate — 5
2 Filament sheath 9–13 mm long; racemes 4–20-flowered — 1. *S. sesban*
Filament sheath 15–24 mm long — 3
3 Leaflets pubescent above and below, in 4–8 or rarely up to 12 pairs; stems pubescent; racemes 1–2-flowered — 2. *S. goetzei*

Leaflets glabrous, rest of plant almost so 4
4 Racemes 1–2-flowered; leaflets in 4–9 or rarely up to 13 pairs 3. *S. keniensis*
Racemes 4–15-flowered; leaflets in 10–24 pairs 4. *S. dummeri*
5 Appendages at base of standard with short acute free tips, the blade longer than wide and widest above the middle; filament sheath 12–18 mm long; pod rectangular in cross-section with acute angles, the septa 5–5·5 mm apart 5. *S. quadrata*
Appendages at base of standard rounded, without free tips, the blade widest below the middle, wider than long; filament sheath 10–13 mm long; pod elliptic in cross-section, the septa 8–11 mm apart 6. *S. macrantha*

1. Sesbania sesban (*L.*) *Merr.*
Becoming a short-lived shrub or small tree, see KTS p. 376.
Usually by water or in places water-logged during the rains; below 5700 ft. HA, KIT, MUM, KIS, RV, MAC, NBI.
Bogdan 1788; Brodhurst-Hill 569.

2. Sesbania goetzei *Harms*
Becoming a short-lived shrub or small tree, see KTS p. 375.
At the margins of mildly alkaline lakes, abundant around Lake Nakuru, 3600–5500 ft. RV, KAJ.
Mettam 201; Gillett 18311.

3. Sesbania keniensis *Gillett*
Becoming a short-lived shrub or small tree, closely resembling *S. goetzei* but almost glabrous throughout; referred to as an apparent new species under *S. sesban* in KTS p. 376.
By fresh-water streams and lakes and at forest margins; 3600–7200 ft. HT, HM, HL, HA, HK, KIS, NAR, RV, NAN, NBI, KAJ.
Rayner 413; Kirrika in Bally 7757.

4. Sesbania dummeri *Phill. & Hutch.*
Tall herb, shrub or small tree up to 5 m tall, resembling *S. keniensis* but the racemes 4–15-flowered and leaflets in 10–20 pairs; the stems and leaf rachis may be sparsely aculeate.
Uncommon plant found in wet places, 5400–6000 ft. KIT.
Fulton in EAH 13871; Chater-Jack 134.

5. Sesbania quadrata *Gillett*
Annual herb, 1–3 m tall; leaf rachis usually minutely aculeate, and leaflets in 6–30 pairs, glabrous or with a few hairs at the margins; racemes 5–12-flowered; pod usually purple-spotted at the septa, just as thick at the sutures as in the centre and thus quadrangular in cross-section.
Confused with *S. bispinosa*, a species found in the coastal province, in KTS p. 375.
Grassy places water-logged in the rains, 1500–3600 ft. KIS, MAG, MAC, KAJ.
Bally 12289; Gillett 17197.

6. Sesbania macrantha *Phill. & Hutch.*
Becoming a softly woody shrub or small tree up to 6 m tall; see KTS p. 375.
Uncommon plant found in areas once forested, 4200–6000 ft. MUM, HA.
Moore in Bally 8046; Battiscombe 8.

6. ORMOCARPUM *P. Beauv.*
Shrubs or small trees with normal white hairs and thick stiff ones, particularly on fruits and young twigs; leaves often fasciculate, imparipinnate, with striate, persistent, stipules no stipels, and ± alternate leaflets; flowers in few-flowered racemes or solitary, with bract and bracteoles persistent; calyx lobes longer than the tube, the upper lobes joined for over half their length; corolla glabrous, the standard with 2 ridges or scales at base; stamens usually joined laterally in two semicylinders of 5, but variable; ovary 3–9-ovulate, sometimes constricted between the seeds; becoming stiffly hairy in fruit.

1 Corolla persistent, pinkish or purple; fruit hairs under 1·5 mm long 2
Corolla caducous, cream or bluish; fruit hairs over 5 mm long 3. *O. trichocarpum*
2 Fruit more or less straight, protruding from corolla; standard blade not cordate; leaflet margins not revolute 2. *O. trachycarpum*
Fruit curved, hidden in corolla; standard blade cordate; leaflet margins revolute 1. *O. kirkii*

1. Ormocarpum kirkii *S. Moore*
Dealt with in KTS, p. 372. MAC, KAJ.

2. Ormocarpum trachycarpum (*Taub.*) *Harms* (*O. mimosoides* sensu KTS non S. Moore, *O. aromaticum* Bak. f.)
A shrub 1–6 m tall in KTS p. 373. Frequent in open bushland, 3200–6500 ft. HA, NAR, RV, NAN, MAC, NBI, KAJ.

3. Ormocarpum trichocarpum (*Taub.*) *Engl.* (see p. 262)
A much branched shrub, 1–5 m tall with whitish twigs, solitary flowers and cylindrical densely yellow-hairy fruit.

Uncommon plant found in dry bushland. MUM, KIS, BAR, NAR.
Trelawney 4327.

7. AESCHYNOMENE *L.*

Herbs or shrubs with pinnate leaves, no stipels and axillary racemes of usually showy yellow or orange flowers; calyx 2-lipped; corolla standard with appendages at the base of the claw; corolla wings with a lateral spur and a series of small pockets; stamens (9) + 1, or (10), sometimes in two groups of 5; anthers uniform; ovary linear, 2–18-ovuled; style inflexed, mostly glabrous; pods linear to elliptic, compressed, straight or curved, jointed between the seeds.

1 Pods with straight or crenate margins; seeds more than 3 — 2
Pods of 1–3, 1-seeded portions, joined by narrow necks — 7
2 Stems spiny; pods spirally coiled — 3. *A. elaphroxylon*
Stems not spiny; pods straight — 3
3 Keel petals laciniate along lower margins — 4
Keel petals not laciniate along lower margins — 2. *A. indica*
4 Inflorescences usually 1-flowered; calyx lips usually entire — 5
Inflorescences usually 2–8-flowered; calyx lips 2–3-toothed — 6
5 Bracts present on pedicel; pods not constricted between seeds — 4. *A. schimperi*
Bracts absent; pods constricted between seeds — 1. *A. uniflora*
6 Stems with soft glandular hairs; leaves with over 40 leaflets; pods linear — 5. *A. cristata*
Stems with stiff hairs; leaves with less than 40 leaflets; pods oblong-elliptic — 6. *A. pfundii*
7 Corolla wings entirely free; standard without swellings at base of lamina — 7. *A. gracilipes*
Corolla wings adhering to each other by basal appendages; standard with 2, often obscure, basal appendages — 8
8 Main nerve of leaflets marginal or submarginal — 8. *A. mimosifolia*
Main nerve of leaflets central or nearly so — 9. *A. abyssinica*

1. Aeschynomene uniflora *E. Mey.*

An erect shrubby often annual hairy herb; leaves with numerous sensitive leaflets; flowers solitary, yellow-white with a greenish keel.
Locally common in marshes in forest clearings below 4000 ft. MUM.
Tweedie 3618.

2. Aeschynomene indica *L.*

An erect, glabrous shrubby herb with over 20 pairs of oblong leaflets to each leaf, and small yellow flowers.
Locally common in ephemeral pool edges in hot country. MAC.
Hildebrandt 2853.

3. Aeschynomene elaphroxylon (*Guill. & Perr.*) *Taub.*

A spiny shrub or tree with 8–15 pairs of broad-oblong retuse leaflets to each spiny leaf and large solitary orange flowers.
Locally dominant in water edges in warmer country, the large pithy stems are used for boat-building on Lake Victoria. MUM.
Dummer 1782.

4. Aeschynomene schimperi *A. Rich.*

A softly bristly herb with 18–30 pairs of narrow oblong leaflets to each leaf and conspicuous orange and yellow flowers.
Common in marshes and riversides in the upland area. HE, HT, HA, HK, KIT, NAN, EMB, MAC, NBI.
Kabuye 84.

5. Aeschynomene cristata *Vatke*

An erect herb or shrub, glabrous (except for the calyx), with 10–24 pairs of oblong leaflets to the leaf and small racemes of orange and yellow flowers.
In marshes up to 3200 ft. MUM, BAR.
J. Leakey in EAH 14303, 14789.

6. Aeschynomene pfundii *Taub.*

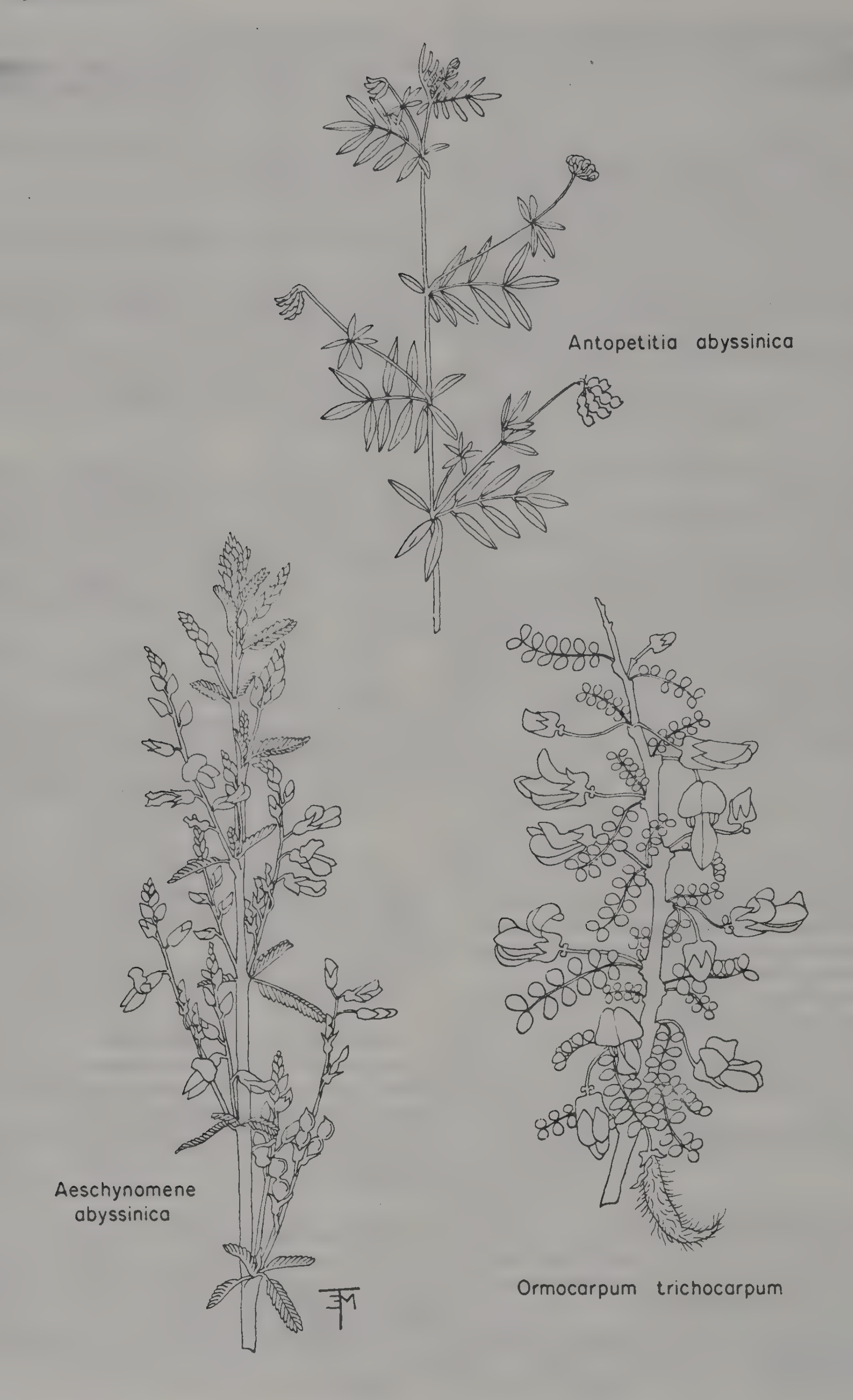
A small shrub with pithy stems covered with golden hairs; flowers 3–7 together, orange-yellow; pod 1·1–1·7 cm wide.
Uncommon in lake edges. HA (Solai).
Richardson 25.

7. Aeschynomene gracilipes *Taub.*

A low spreading pubescent herb with 6–14 pairs of oblong leaflets to each leaf and small yellow flowers; pods with a long basal stalk.
Rare and only once collected in the Mbooni Hills. MAC.
Bogdan 1179.

8. Aeschynomene mimosifolia *Vatke*

An erect bristly wiry herb with 6–14 pairs of asymmetric, crowded leaflets to the leaf and small yellow flowers in long racemes.
Uncommon plant found in dry bushland. EMB, MAC.
Graham 2406.


Antopetitia abyssinica
Aeschynomene abyssinica
Ormocarpum trichocarpum

9. Aeschynomene abyssinica (*A. Rich.*) *Vatke* (see p. 262)

Similar to *A. mimosifolia* but larger in all parts and ± glabrous.

Locally common in forest edges and disturbed ground. HE, HC, HT, HM, HA, HK, KIT, KIS, RV, KAJ.

Bally 8211.

8. SMITHIA *Ait.*

Similar to *Kotschya* but with the keyed differences and the lateral appendages of the keel petals nearly as long as the claws.

Smithia elliotii *Bak. f.* (see p. 264)

A sparsely-hairy, weak woody-stemmed herb with 8–12 pairs of oblong-elliptic leaflets to each leaf and tight axillary umbels of mauve flowers.

Rare plant found in swamps within the montane forest area. HE.

Tweedie 1325.

9. KOTSCHYA *Endl.*

Herbs or shrubs with glandular hairs and pinnate leaves; leaflets alternate, asymmetric at the base; stipels absent; inflorescences mainly dense, axillary ± scorpioid, with reflexed, often distichous flowers; bracts entire; bracteoles free or connate; calyx scarious, 5-lobed, with a short tube; corolla small, white, yellow or blue; stamens (10); anthers uniform; ovary stalked, 2–9-ovuled; style glabrous; pods stalked, of 1–9-joints, the joints often folded together, enclosed in the calyx.

1 Plant annual; flowers in globose heads — 4. *K. capitulifera*
  Plant perennial; flowers in elongated inflorescences — 2
2 Claw of standard petal over half the length of the lamina; ovary glabrous — 3. *K. aeschynomenoides*
  Claw of standard petal less than half the length of the lamina; ovary pubescent — 3
3 Leaflets distinctly curved, in 4–9 pairs — 2. *K. recurvifolia*
  Leaflets not curved, in 8–22 pairs — 1. *K. africana*

1. Kotschya africana *Endl.*

An erect glandular-hairy shrub with numerous ovate leaflets and large yellow flowers terminating a raceme of sterile bracts.

This species much resembles an herbaceous *Cassia.* Rare plant found in upland grassland. HT, KIT, MUM.

Dowson 666.

2. Kotschya recurvifolia (*Taub.*) *F. White*

An erect bushy glandular shrub with recurved leaves and yellow flowers on condensed paniculate inflorescences.

Locally common in dry montane forest edges. HC, HM, HA, HK.

Gillett 16257.

3. Kotschya aeschynomenoides (*Bak.*) *Dewit & Duvign.*

An erect weak glandular shrub with over 10 pairs of oblong leaflets to each leaf; flowers white and purple, distichous, in viscid spikes.

Disturbed bushland in montane forest. HK, MAC.

Fries 1903.

4. Kotschya capitulifera (*Bak.*) *Dewit & Duvign.*

An erect pubescent eglandular annual with 6–12 pairs of asymmetric oblong leaflets to each leaf; flowers white, in globose heads.

Rare plant of shallow-soil grassland, only once recorded from Kenya in HT.

Williams 298.

10. STYLOSANTHES *Swartz*

Herbs or shrubs with trifoliolate leaves and dense, few-flowered, axillary or terminal inflorescences of subsessile yellow flowers; bracts 1-foliolate; subsidiary bracts hyaline; calyx 5-lobed; corolla wings and keels with a lateral basal spur and appendage and also with small pockets on the blade; stamens (10); anthers 5 longer and basifixed alternating with 5 shorter and versatile; ovary 2–3-ovuled; style filiform, breaking later, the lower part persistent, curved and dilated, simulating a stigma; pods oblong, compressed, beaked, 1–2-jointed but the upper or lower joints often aborted.

Stylosanthes fruticosa (*Retz.*) *Alston*

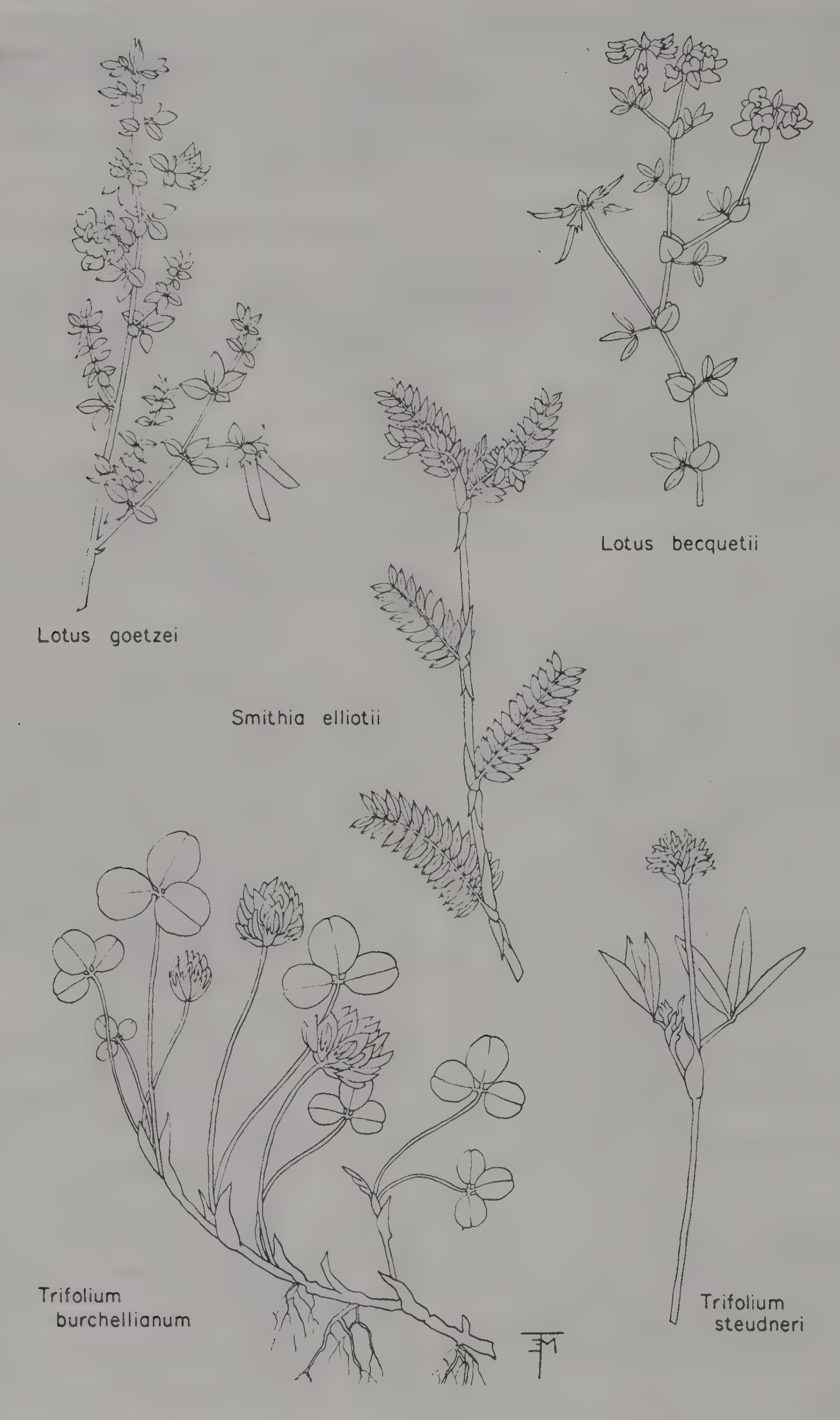
A small wiry pubescent shrub with elliptic, acute leaflets and subsessile yellow flowers.

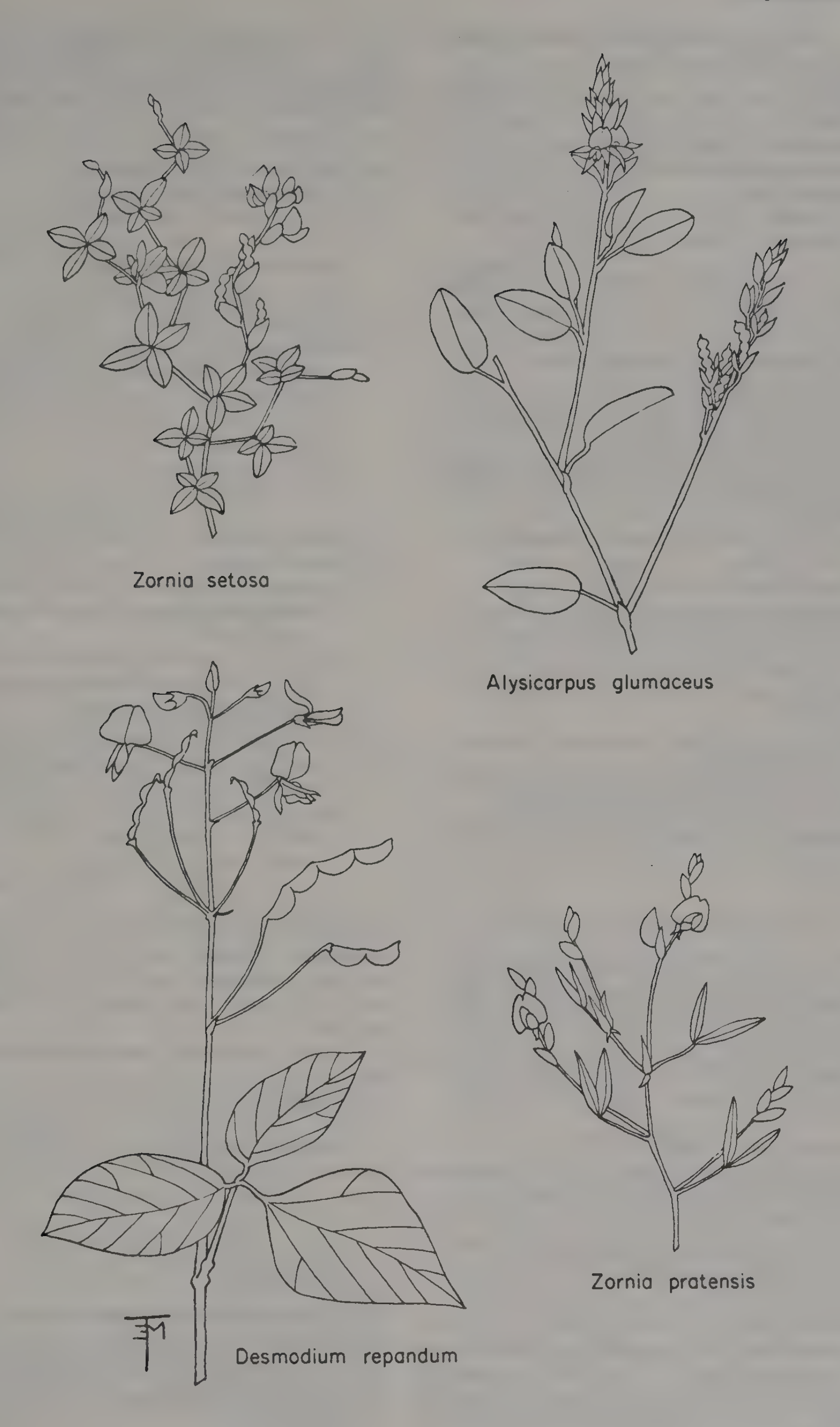
Common in grassland and forest edges, especially in rocky soils. HA, MUM, KIS, BAR, RV, EMB, MAC, NBI.

Napper 1571; Mwangangi 284.

11. ZORNIA *J. F. Gmel.*

Herbs with palmately divided, 2–4 foliolate, mostly glandular leaves without stipels; inflorescence of terminal or axillary spikes; bracts paired, stipule-like, mostly peltate, enclosing the flowers; calyx 5-lobed, persistent; corolla mostly yellow or orange; stamens (10), all similar, ovary subsessile; pods sessile, 2–15-jointed, the joints glabrous to


Lotus goetzei
Lotus becquetii
Smithia elliotii
Trifolium burchellianum
Trifolium steudneri


Zornia setosa
Alysicarpus glumaceus
Desmodium repandum
Zornia pratensis

pilose, mostly prominently nerved; seeds compressed, without appendages.

1 Leaflets 4 — 1. *Z. setosa*
 Leaflets 2 — 2
2 Flowers shorter than the bracts — 3
 Flowers longer than the bracts — 4
3 Plant perennial — 2. *Z. albolutescens*
 Plant annual — 3. *Z. glochidiata*
4 Leaflets linear; fruit hairs not sticky — 4. *Z. pratensis*
 Leaflets ovate; fruit sticky with retrorsely bristly hairs — 5. *Z. apiculata*

1. Zornia setosa *Bak. f.* (see p. 265)

A trailing perennial herb with short-petiolate leaves; flowers orange or yellow or even pinkish in short axillary and terminal spikes.

Common in grassland with impeded drainage. HE, HC, HT, HM, HA, KIT, MUM, NAR, RV, MAC, NBI, KAJ.

Drummond and Hemsley 4478; Napier 1910.

2. Zornia albolutescens *Mohl.*

A trailing glandular perennial herb from a woody rootstock with 2 asymmetric elliptic leaflets on each leaf; flowers yellow.

Rare plant found in wooded grassland. MAC.

Bogdan 4023.

3. Zornia glochidiata *DC.*

Very similar to *Z. albolutescens* but an annual with, in our area, fewer glands on the leaves.

Uncommon plant found in dry bushland. MUM, BAR.

Bogdan 2038.

4. Zornia pratensis *Milne-Redh.* (see p. 265)

A tufted perennial from a fibrous rootstock with prostrate branches bearing 2-foliolate leaves; leaflets linear-elliptic; flowers yellow and reddish-brown or orange.

Locally common in wooded grassland. HE, HT, KIT, MUM, NAR.

Tweedie 561; McDonald 1028..

5. Zornia apiculata *Milne-Redh.*

A semi-erect perennial similar to *Z. pratensis* except for the ovate-elliptic leaflets and the longer fruit bristles.

Locally common in dry, rocky bushland. MAC.

Bogdan 3896; Verdcourt 701.

12. DESMODIUM *Desv.*

Herbs or low shrubs with simple hairs and without glands; leaves unifoliolate or trifoliolate, the leaflets stipellate, entire; flowers in terminal panicles or pseudo-racemes, pink or purplish, pedicellate, without bracteoles, but sometimes with accessory bracts; calyx with 5 ± equal teeth; standard glabrous outside; stamens (9) + 1; anthers all fertile and similar; ovary sessile, with a filiform style; fruit flattened, breaking into 1-seeded joints.

1 Secondary bracts present — 2
 Secondary bracts absent — 6
2 Flowers over 10 mm long; fruits stipitate — 4. *D. repandum*
 Flowers less than 7·5 mm long; fruits sessile — 3
3 Leaves 1-foliolate — 4
 Leaves 3-foliolate — 5
4 Leaflet margins mostly sinuate; stipules abruptly narrowed at base and with a long slender apex — 5. *D. velutinum*
 Leaflets entire; stipules gradually narrowed throughout their length — 6. *D. gangeticum*
5 Calyx 2-lipped, lips entire — 7. *D. salicifolium*
 Calyx 5-lobed or lips with 2 and 3 lobes — 8. *D. dregeanum*
6 Calyx 5-lobed — 9. *D. barbatum*
 Calyx 2-lipped — 7
7 Racemes elongated, much exceeding the leaves, the lower internodes longer than the pedicels — 8
 Racemes condensed, hardly exceeding the leaves, with the lower internodes much shorter than the pedicels — 1. *D. triflorum*
8 Most pedicels longer than the corolla; fruit outline convex on both edges between constrictions — 2. *D. setigerum*
 Most pedicels shorter than the corolla; fruit outline concave above, convex below, between the constrictions — 3. *D. ramosissimum*

1. Desmodium triflorum (*L.*) *DC.*

A trailing perennial herb with trifoliolate leaves bearing ± orbicular leaflets; flowers small, few, axillary towards the ends of the branches, purplish.

Locally common, found in stony grassland. MUM.

Tweedie 2614.

2. Desmodium setigerum (*E. Mey.*) *Harv.*

An erect or straggling herb with trifoliolate leaves bearing obovate leaflets; flowers small, mauve, in terminal racemes.

Rare, found in wet grassland. KIS.

Buxton 6034.

3. Desmodium ramosissimum *G. Don*

Similar to *D. setigerum* but without the long hairs on the stem and with more oblong leaflets.

Recorded from grassland in Nairobi. NBI.

Dowson 285.

4. Desmodium repandum (*Vahl*) *DC.* (see p. 265)

A loosely branched herb with trifoliolate leaves bearing ovate to rhomboid leaflets; flowers reddish-pink.

Common, in shade in forest, particularly by streams and along pathsides where its sticky fruits are easily picked up. HE, HT, HM, HA, KIT, MUM.

Paulo 508; Glover 2180.

5. Desmodium velutinum (*Willd.*) *DC.*

An erect woody herb or shrub with simple broad elliptic to rhombic leaves and axillary and terminal racemes of crowded pink to purple flowers.

Uncommon, found in forest edges and tall grassland. MUM.

Powell 28.

6. Desmodium gangeticum (*L.*) *DC.*

A trailing herb with simple ovate leaves and axillary and terminal racemes of pink to purple flowers.

Deciduous woodland and wet grassland. NBI.

White s.n.

7. Desmodium salicifolium (*Poir.*) *DC.*

An erect wiry herb with trifoliolate leaves bearing lanceolate-elliptic leaflets; flowers pinkish.

Locally common, found in shaded riverine habitats in western Kenya. KIT, KIS.

Tweedie 2858.

8. Desmodium dregeanum *Benth.*

A woody trailing herb with trifoliolate leaves bearing apparently sensitive, obovate, apiculate leaflets; inflorescence of dense spike-like racemes.

Uncommon, found in forest edges. MUM.

White s.n.

9. Desmodium barbatum (*L.*) *Benth.*

Similar to *D. triflorum* but with almost reniform leaflets and denser inflorescences which are definitely terminal.

In wooded grassland. MUM, KIS, NAR.

Tweedie 3533.

13. PYCNOSPORA *Wight & Arn.*

Woody herbs with pinnately trifoliolate stipellate leaves and terminal panicles of purplish flowers; bracts membranous, deciduous; bracteoles absent; calyx 5-lobed; corolla wings oblong, adherent to the keel; keel petals with small appendages near the base; stamens (9) + 1; anthers uniform; ovary many-ovuled; style subulate, glabrous; pod oblong, inflated, not septate.

Pycnospora lutescens (*Poir.*) *Schindl.*

A pubescent perennial with tufts of ascending stems from a woody rootstock and with oblong to broad-elliptic leaflets; flowers violet-blue in a terminal raceme-like panicle; pods ovoid, blackish.

Uncommon plant found in rocky, wooded grassland. MUM, KIS.

Kokwaro 58.

14. PSEUDARTHRIA *Wight & Arn.*

Erect perennial herbs or shrubs with pinnately trifoliolate stipellate leaves and paniculate terminal or axillary inflorescences; bracts narrow; bracteoles absent or soon falling; calyx 5-lobed, the lobes ± equal; corolla small, purple, pink, or white, glabrous; stamens (9) + 1; anthers uniform; ovary many-ovuled; style filiform, glabrous; stigma capitate; pods linear, compressed, and sinuate between the seeds but not breaking into 1-seeded joints.

1 Inflorescence dense, with pedicels hidden; flowers mostly in pairs; pods sessile, slightly curved — 1. *P. confertiflora*
 Inflorescence lax with pedicels clearly visible; flowers in fascicles of 3–4, the middle one often reduced; pods mostly stipitate, straight — 2. *P. hookeri*

1. Pseudarthria confertiflora (*A. Rich.*) *Bak.*

An erect densely pubescent woody herb with elliptic leaflets and crowded spike-like axillary inflorescences of pink flowers.

Uncommon plant found in upland wooded grassland. HE, HT, HM, HA, RV, KIT, NAN, EMB, MAC, NBI.

Graham 2180.

2. Pseudarthria hookeri *Wight & Arn.*

Similar to *P. confertiflora* but with looser inflorescences mostly in a terminal panicle.

Locally common in wooded grassland. HE, HC, HT, KIT, MUM, KIS, NAR, RV, MAC, KAJ.

Glover *et al.* 1805.

15. ALYSICARPUS *Desv.*

Herbs with simple or rarely trifoliolate leaves; flowers pinkish to purple in terminal panicles or false racemes; bracts present; bracteoles absent; calyx scarious, appearing 4-lobed; stamens (9) + 1, with alternate long and short filaments; anthers all similar; ovary sessile, many-ovuled; style glabrous, filiform; stigma capitate; pods linear-oblong, many-jointed, indehiscent, with straight or crenate margins.

1 Pods with straight margins, not constricted between the seeds — 1. *A vaginalis*

Pods with definite constrictions between the seeds 2

2 Individual portions of the pod smooth 2. *A. zeyheri*

Individual portions of the pod sculptured 3

3 Calyx lobes overlapping at base, with white or rusty hairs 3. *A rugosus*

Calyx lobes hardly overlapping at the base, never with rusty hairs 4

4 Individual portions of the pod with transverse ridges only 4. *A. glumaceus*

Individual portions of the pod with a raised network of ridges 5. *A.* sp. *A*

1. Alysicarpus vaginalis (*L.*) *DC.*

A tufted perennial from a woody rootstock with ovate to lanceolate or oblong-elliptic leaves and long terminal false racemes of pinkish flowers; pods cylindrical, much longer than the calyx.

Uncommon, found in dry bushland. MUM, MAC.

Bogdan 3920.

2. Alysicarpus zeyheri *Harv.*

A tufted perennial from a woody rootstock with linear-lanceolate leaves and pink to mauve flowers in terminal false racemes; pods ± as long as the calyx.

Locally common plant found in wooded grassland. HT, KIT, EMB, NBI.

Verdcourt 3170.

3. Alysicarpus rugosus (*Willd.*) *DC.*

Similar to *A. zeyheri* but with the keyed differences.

Locally common plant found in temporarily flooded areas in dry country and in grassland with impeded drainage. HE, HM, HA, KIT, KIS, NAR, BAR, EMB, NBI, KAJ.

Buxton 1266.

4. Alysicarpus glumaceus (*Vahl*) *DC.* (see p. 265)

An erect annual with linear-lanceolate to elliptic leaves and short terminal false racemes of pinkish-buff flowers; fruit much longer than the calyx, conspicuously lobed and roughened.

Common plant found in seasonally flooded grassland, especially short grass on shallow soils. HE, BAR, NAR, MAC, NBI, KAJ.

Glover *et al.* 1573.

5. Alysicarpus *sp.* **A** *of FTEA*

Similar to *A. glumaceus* but with shorter inflorescences and the keyed fruit differences.

Known from but one gathering on the Magadi Road. MAG.

Bogdan 3472.

16. AMPHICARPA *Nuttall*

Climbing herbs with pinnately trifoliolate stipellate leaves and axillary racemes; calyx tubular, appearing 4-toothed; corolla small, white, purple or blue; stamens (9) + 1; anthers all similar or, in cleistogamous flowers, only 2-5 fertile; ovary ± sessile, many-ovuled; style filiform, glabrous; pod linear or falcate, compressed, not septate.

Amphicarpa africana (*Hook. f.*) *Harms* (see p. 269)

A perennial silky-hairy climber with suborbicular to elliptic leaflets and false racemes of attractive, violet flowers.

Locally common in montane forest edges. HE, HM, HA, HK, KIT, MUM, KAJ.

Verdcourt 2300.

17. DUMASIA *DC.*

Climbers with pinnately trifoliolate stipellate leaves and axillary racemose inflorescences of small flowers; calyx cylindrical, mouth oblique, lobes obsolete; stamens (9) + 1; anthers uniform; ovary with a small stalk, 4-many-ovuled; style hairy below, dilated and hollow near the middle, cylindrical at apex; pods linear, compressed, constricted between the seeds but not septate; seeds blue-black, sub-globose.

Dumasia villosa *DC.*

A rusty-hairy climber with ovate leaflets and dense or loose racemes of bright-yellow flowers.

Rare plant found in wet forest. HE, HN, MUM, KAJ.

Irwin 126.

18. CLITORIA *L.*

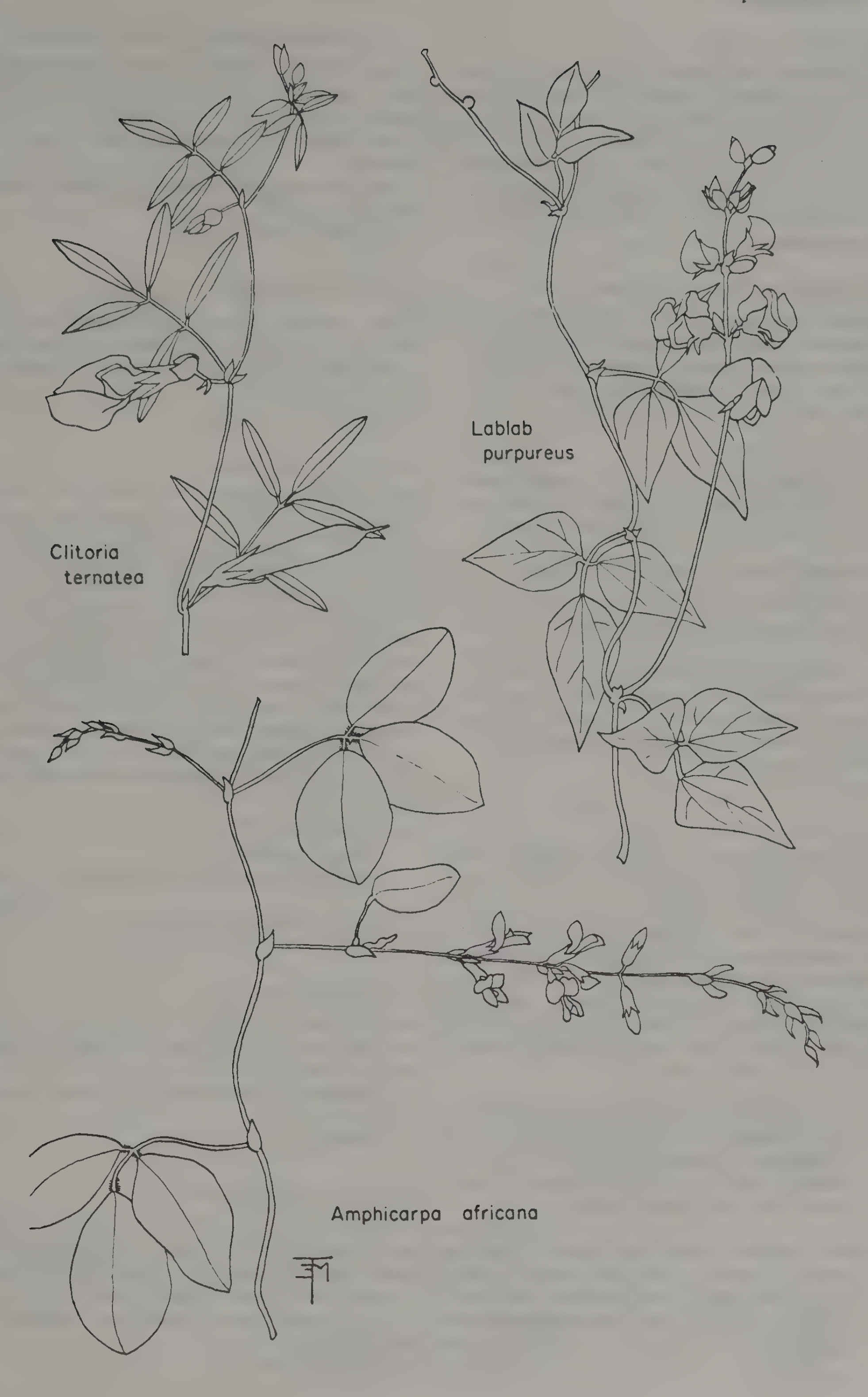
Shrubs, climbers, herbs, or trees with pinnate stipellate leaves bearing 3-9 leaflets; flowers solitary or in racemes; bracts present, the upper pairs connate; bracteoles large; calyx 5-lobed; corolla large, red, white, or blue; standard much longer than the other petals; stamens (9) + 1; anthers uniform or 5 dorsifixed alternating with 5 basifixed; ovary stipitate, 2-many-ovuled; style bearded on upper side; pod linear, compressed, not septate; seeds subglobose.

Clitoria ternatea *L.* (see. p. 269)

A glabrescent climber; leaflets 5-7, often variable in size and shape, linear to orbicular; flowers axillary, solitary or paired, very attractive, blue.

This beautiful climber is found in warmer country, in bushland. MAG, NAN, EMB, MAC, KAJ.

Bogdan 3134.


Clitoria
ternatea
Lablab
purpureus
Amphicarpa africana

19. OPHRESTIA *Forbes*

Climbing or erect herbs with pinnate 1–7-foliolate leaves, stipels minute or absent and flowers in false racemes or axillary clusters; calyx 5-lobed, the lobes equal; stamens (9) + 1; anthers uniform or alternating long and short; ovary subsessile 2–8-ovuled; style short, cylindrical, flattened, curved or hooked, hairy or glabrous; pods oblong-linear, compressed.

Ophrestia radicosa (*A. Rich.*) *Verdc.*

A perennial pubescent climber with trifoliolate leaves, leaflets lanceolate; flowers crowded at the nodes of false racemes, pale purple or cream.

Rare plant found in wooded grassland. KIT.

Bogdan 3498.

20. GLYCINE *Willd.*

A genus similar (in our species) to *Amphicarpa* except for the 5-toothed calyx, smaller corolla and ± septate pod, constricted between the seeds.

Glycine wightii (*Wight & Arn.*) *Verdc.* (see p. 240)

A perennial climber with variable indumentum and axillary racemes of small white to blue or mauve flowers.

Very common and variable with large and small, hairy or glabrous forms, all over the upland area except where very dry. It grows in forest edges and disturbed ground. HA, HT, KIT, BAR, MAG, MAC, NBI, KAJ.

Dowson 471.

21. TERAMNUS *P. Br.*

Perennial climbing herbs, rarely erect shrubs, with trifoliolate stipellate leaves and axillary false racemes of small flowers; calyx 4–5-lobed, depending on whether the upper 2 lobes are free or united; corolla glabrous; stamens (9) + 1 or (10), 5 normal anthers alternating with 5 sterile ones; ovary many-ovuled, often with a tuft of hairs at the apex; style short and thick or obsolete, hidden in hair tuft; stigma capitate; pod linear, 8-seeded, hooked upwards at apex; seeds oblong.

1 Petiole shorter than leaflets; leaflets mostly oblong with the lateral nerves reaching the cartilaginous margin; raceme usually exceeding the subtending leaves; calyx covered by dark brown hairs — 1. *T. uncinatus*

  Petiole mostly longer than leaflets; leaflets mostly elliptic with the lateral nerves hardly reaching the scarcely thickened margin; raceme rarely exceeding the subtending leaf; calyx covered with cream or russet hairs — 2. *T. labialis*

1. **Teramnus uncinatus** (*L.*) *Sw.* (see p. 240)

A wiry climber with russet or brown hairs on stems and nerves of leaflets; leaflets lanceolate to oblong, rarely elliptic, with pronounced nervation on the lower side; flowers white and mauve in long racemes.

Uncommon plant found in wooded grassland. KIT, KAJ.

Tweedie 1340.

2. **Teramnus labialis** (*L. f.*) *Spreng.*

A low twining pubescent perennial with elliptic leaflets and small whitish flowers in short racemes.

Uncommon plant found in dry country. KIT, KIS, NAR, MAC.

Glover *et al.* 1721.

22. MUCUNA *Adans.*

Mostly robust climbers with pinnately-trifoliolate often stipellate leaves and axillary, complex, often paniculate inflorescences; bracts and bracteoles present and deciduous; flowers large and showy, purple to greenish; calyx 4–5-lobed, 2-lipped; stamens (9) + 1; anthers in 2 series, the 5 larger basifixed and alternating with 5 smaller dorsifixed; ovary few-ovuled; style long, filiform, sometimes pubescent but not bearded; pods ovoid, oblong or linear, often covered with irritant bristles, septate between the seeds; seeds globose or oblong.

These are the *buffalo beans* which are often such a painful part of penetrating riverine forest in tropical Africa.

1 Plant erect — 1. *M. stans*

  Plant climbing — 2

2 Pod with two wings bordering the suture — 2. *M. gigantea*

  Pod without sutural wings — 3. *M. poggei*

1. **Mucuna stans** *Bak.*

An erect shrub or tree with ± elliptic leaflets and purplish-black flowers; pods oblong, to 2 cm wide, densely rusty-hairy.

Uncommon plant found in wooded grassland. KIT.

Tweedie 854.

2. **Mucuna gigantea** *Bak.*

A robust climber with ovate acute or acuminate leaflets and long false racemes of greenish flowers; pods large, orbicular to oblong, over 3·5 cm wide, covered with irritant reddish hairs.

Uncommon plant found in riverine forest. MUM.

Glasgow 46/39.



Mucuna poggei

3. Mucuna poggei *Taub.* (see p. 271)

A robust climber with broadly ovate to elliptic, acute leaflets and long false racemes of greenish-yellow flowers; calyx and fruit with rusty irritant hairs; pod over 3·5 cm wide.

Uncommon plant found in riverine forest. KIT. Tweedie 1893.

23. CANAVALIA *Adans.*

Herbs or climbers with pinnately trifoliolate stipellate leaves and axillary racemes of white to purple flowers; calyx 5-lobed, 2-lipped; corolla keel incurved, often twisted; stamens (10) or rarely (9) + 1; anthers all similar; ovary many-ovuled; style glabrous; pods linear or oblong, many-seeded, often winged or ridged along the top and elsewhere, seeds compressed.

1 Leaflets obtuse at apex; seeds white — 1. *C. ensiformis*
  Leaflets acute or acuminate at apex; seeds not white — 2. *C. virosa*

1. Canavalia ensiformis (*L.*) *DC.*

A glabrescent, annual or perennial robust climber with ovate-elliptic leaflets and long racemes of red to purple flowers; pods 15–30 cm long, with 3 narrow ribs on the upper side.

Cultivated and escaped. HA.
Bogdan 3984.

2. Canavalia virosa (*Roxb.*) *Wight & Arn.*

Similar to *C. ensiformis* but with the keyed differences.

This species is common around cultivation in warmer country in western Kenya. MUM, KIS.
Tweedie 2834.

24. PSOPHOCARPUS *DC.*

Herbs or shrubs with pinnately trifoliolate stipellate leaves (in ours) and axillary false racemes or fascicles of blue or purplish flowers; calyx 5-lobed; stamens (9) + 1; anthers 5 dorsifixed, alternating with 5 basifixed; ovary 3–8-ovuled; style bent above the ovary, flattened towards the apex, glabrous or bearded; stigma penicillate; pods oblong, 4-winged along the angles, dehiscent, ± septate.

Psophocarpus lancifolius *Harms* (see p. 273)

A pubescent climber with ovate to linear-oblong leaflets and axillary, shortly pedunculate, umbel-like groups of attractive violet-purple flowers.

Uncommon plant found in wooded grassland. KIT.
Bogdan 3545.

25. VATOVAEA *Chiov.*

Woody climbers with pinnately trifoliolate stipellate leaves and axillary false racemes of purplish flowers; calyx 5-lobed, 2-lipped; corolla wings with a long narrow spur; stamens (9) + 1; anthers uniform; ovary linear, 9–12-ovuled; style long, incurved, bearded within towards the apex and with a reflexed appendage above the oblique stigma; pod linear-oblong, dehiscent.

Vatovaea pseudolablab (*Harms*) *Gillett*

A woody glabrescent climber from a large woody tuber with ovate to orbicular, acute to emarginate leaflets and long racemes of purple flowers.

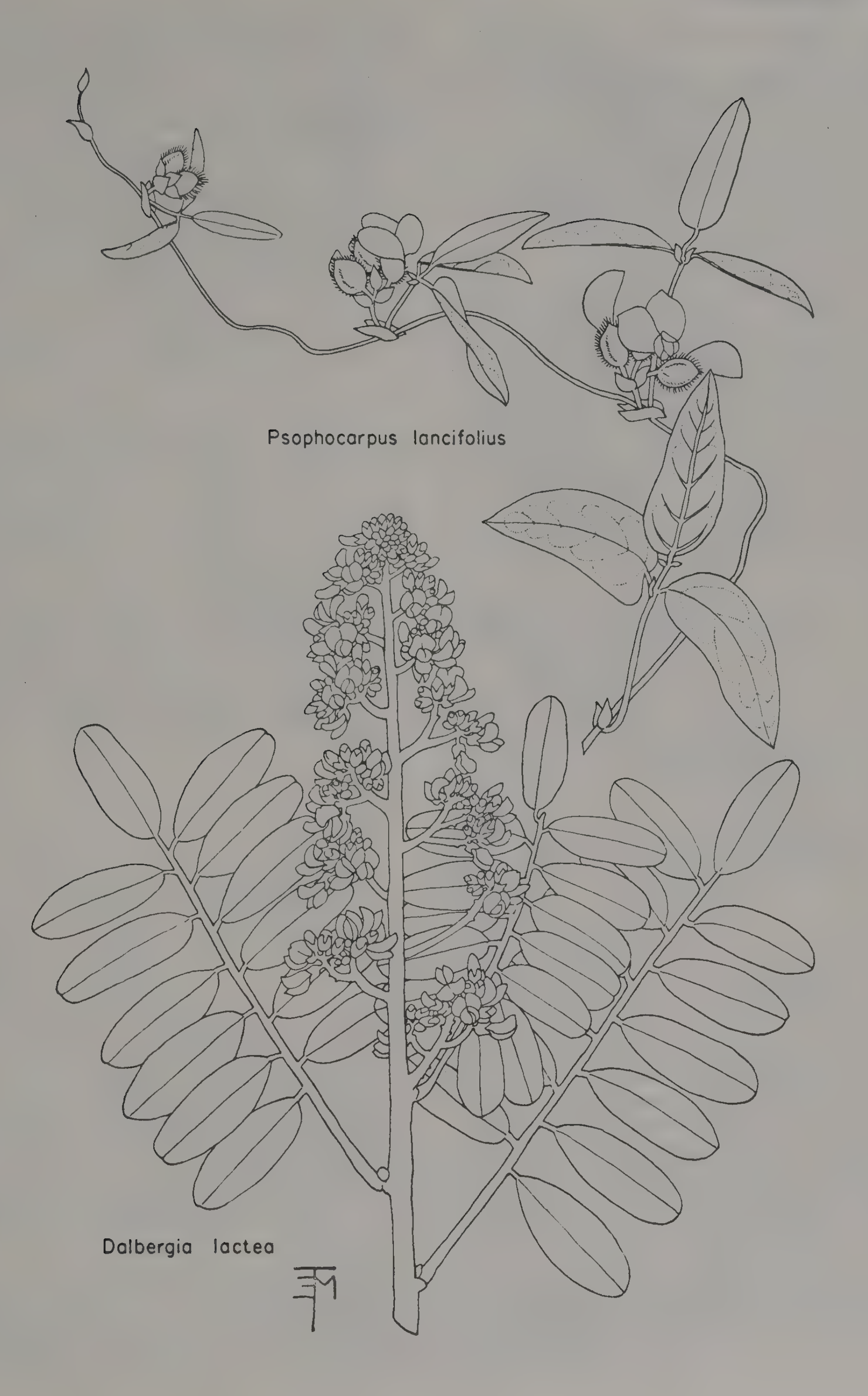
Locally common in dry grassland, especially on soils with impeded drainage. MAG, MAC, KAJ.
Bogdan 5133.

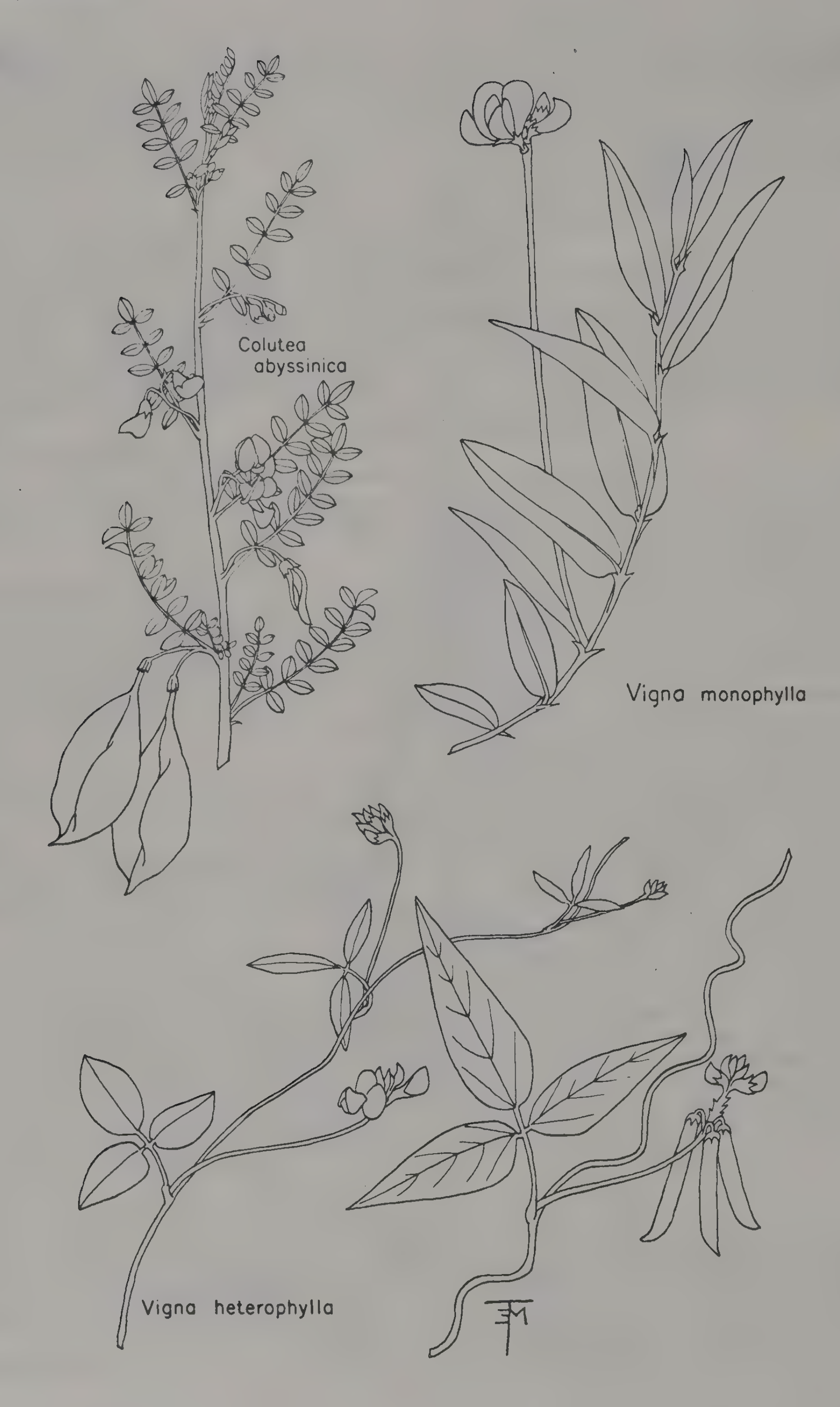
26. VIGNA *Savi.*

Twining, prostrate or erect herbs or, less often, subshrubs, usually from woody or tuberous rootstocks, with simple or pinnately trifoliolate leaves; stipels often present; inflorescence a raceme, usually much condensed so that it is nearly always much shorter than the peduncle and sometimes sub-umbellate; bracts and bracteoles more or less deciduous; calyx 2-lipped, the lower lip of 3 lobes, the upper of 2 usually wholly or partially united lobes; corolla small or medium-sized; the standard with inflexed auricles and usually with 2–4 appendages inside near the base; keel truncate, obtuse or, more often, beaked, the beak erect or incurved; ovary 3–many-ovulate; style with a thin lower and a thicker cartilaginous upper part which is barbate or hirsute on the inner surface and is often produced beyond the stigma; stigma completely lateral, oblique or rarely terminal; pods linear or linear-oblong, cylindrical or flattened, straight or curved, usually more or less septate.

Note in this key that purple denotes various shades from pink to dark blue, as contrasted with yellow-green; purple corollas may have yellow streaks on the standard and pale yellow bases to the petals, especially the keel. The left- and right-hand sides of the flower are stated with respect to the flower i.e. as though one were standing with one's back to the inflorescence-rachis.

1 Leaves simple — 2
  Leaves 3-foliolate — 3
2 Erect or ascending herb; peduncles longer than leaves — 18. *V. monophylla*
  Twining herb; peduncles shorter than leaves — 14. *V.* sp. *B*
3 Standard densely pubescent outside — 4
  Standard glabrous — 5


Psophocarpus lancifolius
Dalbergia lactea


Colutea
abyssinica
Vigna monophylla
Vigna heterophylla

4 Calyx lobes longer than or equal to the tube and narrow; indumentum of calyx and fruit mostly spreading 6. *V. heterophylla*
Calyx lobes short and wide, much shorter than the tube; indumentum of calyx and fruit mostly appressed 7. *V. ambacensis*
5 Keel prolonged into a narrow beak incurved through nearly 360°; inflorescence usually elongate with wide gaps between the nodes 17. *V. macrorhyncha*
Beak of keel absent or much shorter and less incurved; inflorescence usually condensed 6
6 Anthers of the shorter stamens with paired glands at base (use × 10 lens) 19. *V. triphylla*
Anthers of shorter stamens without glands 7
7 Corolla yellow-green; twiners 8
Corolla red, blue, mauve or purple; sometimes ± erect 12
8 Pods ascending 3. *V. schimperi*
Pods deflexed 9
9 Stipules truncate at base; pods 1–3-seeded 5. *V. comosa*
Stipules more or less bilobed at base; pods nearly always more than 3-seeded 10
10 Corolla 0·5–1 cm long 4. *V. oblongifolia*
Corolla well over 1 cm long 11
11 Pods sparsely or densely appressed-pubescent, 4–8 cm long, 6–9(–12)-seeded 1. *V. luteola*
Pods densely covered with spreading red or orange hairs 3–5·5 cm long, *c.* 11-seeded 2. *V. fischeri*
12 Pods deflexed, 1–2·5 cm long, 2–5-seeded 8. *V. parkeri*
Pods ascending, longer and with more seeds 13
13 Stipules peltate with a marked entire spur projecting below the base 14
Stipules not peltate 15
14 Keel without a marked pocket; style with a very short ± reflexed projection beyond the stigma (native and cultivated) 11. *V. unguiculata*
Keel with a distinct, upwardly directed pocket on left-hand side; style with a distinct beak beyond the stigma (cultivated) 16. *V. radiata*
15 Flowers often appearing before the leaves; style with a subulate beak *c.* 2 mm long projecting beyond the stigma 12. *V. frutescens*
Flowers not appearing before the leaves; beak of style, if present, under 2 mm long 16
16 Stems erect or almost so; corolla 1–1·4 cm long 10. *V. friesiorum*
Stems twining or prostrate; corolla usually over 1·4 cm long 17
17 Keel with a distinct upwardly directed conical pocket on left-hand side 15. *V. vexillata*
Keel without such a pocket 18
18 Tertiary venation of leaflets close and transversely parallel 13. *V. reticulata*
Tertiary venation of leaflets more open 9. *V. membranacea*

1. Vigna luteola (*Jacq.*) *Benth.* (*V. nilotica* (Del.) Hook f.; *V. bukobensis* Harms)

Perennial twiner, stipules shortly bilobed at base; leaflets entire, sparsely pilose on both sides; inflorescence few-flowered; rachis 1·5–5 cm long; pedicels 4–9 mm long; calyx pubescent or glabrescent; tube 3–4 mm long; lobes deltoid, 2–4 mm long, the upper pair usually united; corolla greenish or yellow, glabrous, 13–25 mm long; beak of keel short, obtuse; pods 6–10-seeded, deflexed, sparsely or densely appressed-pubescent, 4–8 cm long; seeds up to 6 mm long, the rim-aril hardly developed.

Swampy grassland and forest margins, up to 5800 ft. HA, KIT, KIS, RV, MAC, NBI.

Symes 338; Napier 835.

2. Vigna fischeri *Harms*

Closely resembles *V. luteola* but more hairy throughout, and the pods, instead of the white appressed hairs about 1 mm long seen in *V. luteola*, have dense spreading rusty hairs about 2 mm long.

Rare plant found in swampy grassland and forest margins, 3300–6300 ft. HA, EMB, MAC.

Napier 1299; Battiscombe 1123.

3. Vigna schimperi *Bak.* (see p. 277)

Twiner with a large rootstock; stems velvety with appressed rust-coloured hairs, later glabrescent; leaflets entire, pubescent on both sides; stipules truncate or slightly bilobed at the base; inflorescence subumbellate, the rachis obsolete or up to 13 mm long; pedicels 2–7 mm long; calyx finely appressed-pubescent, the lower lobe 2·5–5 mm long, lateral lobes ovate or deltoid 2–3 mm long, shorter than the tube, upper lobes more or less united to form an acute lip; corolla glabrous, greenish yellow-orange or brownish, 18–25 mm long; pods erect, velvety with appressed rusty hairs, 4–9 cm long, *c.* 16-seeded; seeds up to 3·5 mm long, the rim-aril hardly developed.

Upland grassland and forest margins, 4800–7500 ft. HE, HT, HM, HA, HK, KIT, MUM, KIS, NAN, MAC, KAJ.

Bally 821; Harvey 206.

4. Vigna oblongifolia *A. Rich.* (*V. lancifolia* A. Rich.; *V. parviflora* Bak.)

Annual or perennial, twining or suberect; stems bristly pubescent; leaflets entire, sparsely appressed-pubescent on both sides; inflorescence 2-10-flowered, the rachis 5-25 mm long, pedicels 2-5 mm long; calyx pubescent, the tube 1·5-2 mm long, lobes triangular-lanceolate, 1-4 mm long, the lowest narrow, the upper pair more or less united; corolla glabrous, greenish-yellow, sometimes purple-flushed outside, 6-11 mm long, the beak of the keel short, not incurved; pods more or less deflexed, covered with bristly hairs, 23-65 mm long, 3-9-seeded; seeds up to 4·5 mm long, the rim-aril eccentric, fork-shaped with a short central prong.

Two well-marked varieties occur, var. *oblongifolia* with corolla 9-11 mm and pods over 4 cm long and var. *parviflora* (Bak.) Verdc., which is commoner in Kenya, with corolla 6-8 mm and pods under 4 cm long.

Grassland, often in damp places, and forest margins, 4500-6000 ft. HA, KIT, NAR, RV, MAC, NBI.

Bogdan 309; Glover 3705.

5. Vigna comosa *Bak.* (*V. micrantha* Harms)

Perennial, prostrate or twining, stems densely short white-pubescent; leaflets ovate to lanceolate often hastately lobed, pubescent or glabrescent; inflorescence-rachis 4-65 mm; pedicels 1-2 mm long; calyx pubescent, tube 1·5-2 mm long; lobes triangular, 0·6-1·5 mm long; corolla usually yellow, glabrous, 6-12 mm long, beak of keel short, scarcely incurved; pods deflexed, oblong-falcate, 10-25 mm long, 4-5 mm wide, sparsely pubescent, 1-3-seeded; seeds up to 5 mm long, the rim-aril rugulose, markedly eccentric.

Rare plant found in grassland and bushland, especially in rocky places, 5000 ft. KIT.

Brodhurst-Hill 369.

6. Vigna heterophylla *A. Rich.* (*V. micrantha* Chiov. non Harms; *V. chiovendae* Bak. f.; *V. heterophylla* A. Rich. var. *lanceolata* Wilczek.) (see p. 274)

Annual or perennial twiner, rarely suberect; leaflets entire, ovate or lanceolate, pubescent on both sides; inflorescence-rachis 7-20 mm long; pedicels 1-4 mm long; calyx pubescent with mostly dark-ferrugineous spreading bristly hairs; tube 2-2·5 mm long; lobes narrowly triangular-lanceolate, 3-4 mm long; corolla blue-violet; standard velvety outside, *c.* 11 mm long; pods deflexed, densely covered with dark spreading bristly hairs, 5-10-seeded, 15-43 mm long; seeds up to 4 mm long, the rim-aril very eccentric, usually shorter and more cordate than in the next species.

Grassland, or a weed in wheat fields, 5400-6300 ft. HM, HA, KIT, RV.

Tweedie 79; Brodhurst-Hill 642.

7. Vigna ambacensis *Bak.* (*V. pubigera* Bak.; *V. abyssinica* Taub.; *V. stuhlmannii* Harms)

Doubtfully distinct from *V. heterophylla*, differing in the key characters only.

Grassland and bushland, 4500 ft. KIS.

Napier 3096.

8. Vigna parkeri *Bak.* (*V. gracilis* auct. non (G. & P.) Hook. f.; *V. maranguensis* (Taub.) Harms) (see p. 277)

Perennial, twining or prostrate, sometimes forming mats, the main root slender but tough; leaflets rounded or ovate, pubescent on both sides, the margins densely ciliate; inflorescence 2-5(-10)-flowered; rachis 5-25 mm long; pedicels 1-3 mm long; calyx sparsely pubescent; tube 1·5-2 mm long; lobes deltoid, ovate, or lanceolate, 1-1·5 mm long; corolla glabrous, in our area blue, 5-9(-12) mm long; pods deflexed, pubescent or glabrescent, 2-5-seeded, 1-2(-3) cm long; seeds up to 4 mm long, the rim-aril usually well developed and eccentric.

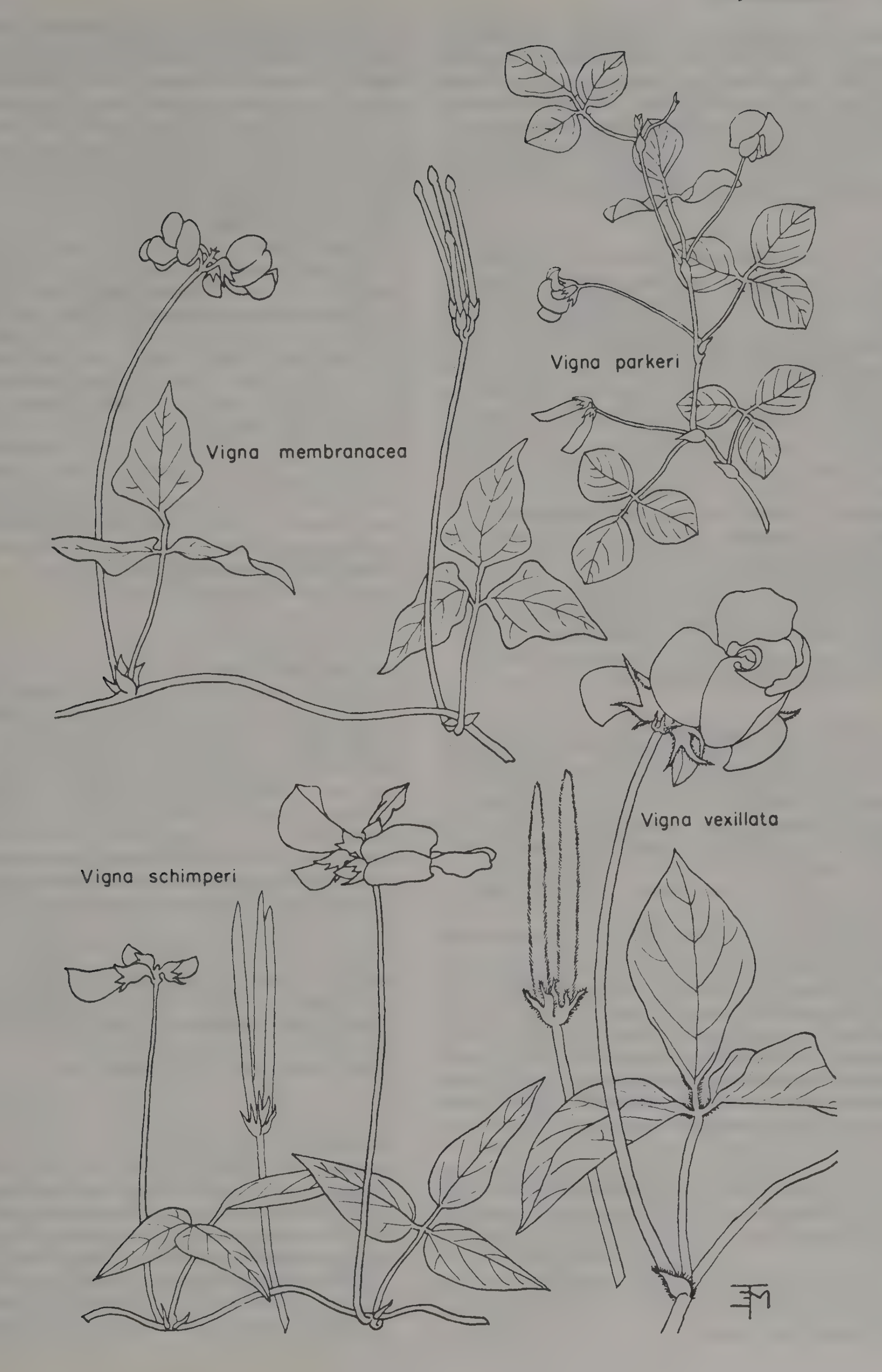
Montane grassland and openings in forest, 4500-8100 ft. HE, HT, HM, HA, HK, KIT, KIS, EMB.

Battiscombe 688; Symes 9.

9. Vigna membranacea *A. Rich.* (*V. mensensis* Schweinf. var. *hastata* Chiov.; *V. leptodon* Harms; *V. caesia* Chiov.; *V. macrodon* Robyns & Boutique; *V. membranaceoides* Robyns & Boutique) (see p. 277)

Annual or perennial twiner, rarely suberect; stems ridged, at first spreading-pilose with tubercle-based hairs, later glabrescent; leaflets often marked with a pale blotch, ovate or ovate-triangular in outline, rounded, truncate or subhastate at the base, often 3-lobed; inflorescence-rachis 3-20 mm long; pedicels 2-4 mm long; calyx glabrous or pilose with tubercle-based hairs, the tube 2-3 mm long, lobes deltoid to linear 2-17 mm long, often conspicuously long-ciliate at the margins, the upper pair almost free so that the calyx seems equally 5-fid; corolla glabrous, pink, blue, or mauve, 10-23 mm long, the keel sometimes twisted but the beak not incurved; pods erect, covered with very short tubercle-based or scale-like hairs, 3-9 cm long, 14-25-seeded; seeds up to 4·5 mm long, the rim-aril not developed.

Three forms occur in our area, ssp. *membranacea* with calyx lobes 5-9 mm and standard


Vigna parkeri
Vigna membranacea
Vigna vexillata
Vigna schimperi

10–15 mm long, ssp. *macrodon* (Robyns & Boutique) Verdc. with calyx lobes 8–17 mm and standard 15–25 mm long and, in dry areas at lower altitudes, ssp. *caesia* (Chiov.) Verdc. with calyx lobes 1·5–7 mm and standard 20–23 mm long.

Grassland, bushland, and dry evergreen forest, up to 6500 ft. HE, HA, KIT, RV, MAC, NBI, KAJ.

Kerfoot 4109; Glover *et al.* 3971.

10. Vigna friesiorum *Harms* (*V. ulugurensis* Harms; ? *V. pygmaea* sensu Bullock non Fries)

Erect or decumbent perennial, up to 30 cm tall, with a carrot-like rootstock; leaflets oblong, elliptic, or linear-lanceolate, glabrous, pubescent or pilose; inflorescence 1–several-flowered, subumbellate; pedicels 1–2 mm long; calyx tube glabrous or hairy, 2–3·5 mm long; lobes deltoid, as long as the tube, the upper pair joined for 2/3 of their length; corolla glabrous, yellowish green-mauve, 10–14 mm long; pods more or less erect, pubescent or with minute scale-like hairs, 4–6 cm long, 17–20-seeded; seeds up to 2·5 mm long, hilum minute, rim-aril not developed.

Two or three varieties occur differing in leaflet shape and pod indumentum. Uncommon, grassland, from 5400–7200 ft. HE, HK, KIT, NAR, MAG.

Harvey 64; Glover *et al.* 2247.

11. Vigna unguiculata (*L.*) *Walp.* (*V. sinensis* (L.) Hassk.; *V. catjang* (Burm.) Walp.; *V. caerulea* Bak.; *V. dekindtiana* Harms; *V. mensensis* Schweinf.)

Annual or perennial, erect, trailing, or climbing; stipules submedifixed; leaflets entire or lobed at the base, glabrous or sparsely pubescent on both sides; inflorescence-rachis 5–40 mm long; pedicels 1–2(–4) mm long; bracteoles spathulate, more or less persistent; calyx glabrous; tube 3–5·5 mm long; lobes 2·5–14 mm long, the upper pair joined at the base or for up to half their length; corolla blue or purple, at least in part, 12–33 mm long; pods glabrous or minutely verruculose, erect or eventually hanging in some cultivated forms, 10–16-seeded, 6–10 cm long, or up to 90 cm in some cultivated forms; seeds up to 5 mm long in wild and to 10 mm in cultivated forms; hilum eccentric; the rim-aril slightly developed.

Various cultivated forms of this 'Cowpea' are grown; wild forms in our area are ssp. *dekindtiana* (Harms) Verdc. with calyx lobes scarcely longer than the tube and ssp. *mensensis* (Schweinf.) Verdc. with calyx lobes much longer than the tube.

Uncommon plant found in bushland, up to 7500 ft. KIS, RV, KAJ.

Napier 2994; Bally 1008.

12. Vigna frutescens *A. Rich.* (*V. esculenta* (De Wild.) De Wild.; *V. fragrans* Bak. f.; *V. incana* Taub.; *V. keniensis* Harms; *V. taubertii* Harms)

Perennial with a woody tuber; stems densely pubescent, eventually prostrate or climbing but sometimes, after fires, producing flowers when under 20 cm tall and then erect and leafless; stipules cordate at the base; leaflets entire or 3-lobed, usually pubescent; inflorescences subumbellate, pedicels 2–4 mm long, bracteoles ovate-oblong, subpersistent; calyx (in our area) velvety pubescent, tube 3·5–5 mm long, lobes 2–10 mm long, the upper pair united for half their length; corolla glabrous, lilac-mauve, 15–26 mm long, beak of keel incurved; pods erect, 12–16-seeded, in our area pubescent with short appressed hairs, 6–11 cm long; seeds 3–5 mm long; hilum central; rim-aril not developed.

Two forms occur in our area; the commoner (ssp. *frutescens*) has calyx lobes 2–5·5 mm long; ssp. *incana* (Taub.) Verdc. has calyx lobes 5–10 mm long. Grassland and bushland, especially in rocky places, up to 7200 ft. HE, HC, HT, HM, HA, KIT, MUM, NAR, MAG, MAC, NBI, KAJ.

Bogdan 3477; Napier 1981.

13. Vigna reticulata *Hook. f.*

Annual or perennial trailing herb; stems densely covered with retrorse or spreading yellowish-brown hairs; stipules cordate; leaflets with appressed bristly hairs on both sides; tertiary veins prominent, closely parallel, at right angles to the midrib; inflorescence subumbellate, 2–6-flowered; pedicels 0–15 mm long; braceteoles lanceolate, deciduous; calyx with bristly white or brown hairs; tube 3–6 mm long; lobes narrowly triangular 6–16 mm long; corolla glabrous, lilac-mauve, 12–33 mm long; pods 6–10-seeded, erect, 4–7 cm long, bristly pubescent or hirsute; seeds 3–4 mm long; hilum eccentric; rim-aril greenish, well-developed.

Uncommon plant found on abandoned cultivation in scattered-tree grassland, 4200–5500 ft. KIT, MUM.

Brodhurst-Hill 476; Tweedie 2884.

14. Vigna *sp.* **B** of FTEA.

Resembles *V. reticulata* but the leaves are unifoliolate; calyx pilose; tube 2–2·5 mm long, lobes triangular, 4 mm long; corolla pinkish; pod erect 14–23 mm long; seeds 2 mm long, the rim-aril hardly developed.

Known from a single gathering, exact locality unknown? *c.* 4800 ft. KIT or MUM.

Irwin 138.

15. Vigna vexillata (*L.*) *A. Rich.* (see p. 277)

Perennial climber or trailer with a narrow woody rootstock; leaflets pubescent on both sides, rarely somewhat lobed, stipules subcordate; inflorescence 2–6-flowered, subumbellate; pedicels 1–2 mm long; bracteoles deciduous, lanceolate, 5–8 mm long; calyx with long bristly often brownish hairs and also short white hairs; tube 5–7 mm long; lobes 2–20 mm long, the keel asymmetric with a marked pocket on the left hand petal, the beak incurved and twisted; pods 10–18-seeded, erect, 4–14 cm long, covered with brown bristly hairs; seeds 2·5–4·5 mm long, the rim-aril hardly developed.

Var. *angustifolia* (Thonn.) Bak., less hairy than var. *vexillata*, has very narrow leaflets and calyx lobes 2–8 mm long. Grassland, bushland, and forest margins, up to 6600 ft. HE, HC, HT, HA, HL, KIT, MUM, RV, MAC, NBI.

Bogdan 3490; Verdcourt 507.

16. Vigna radiata (*L.*) *Wilczek*

Stems covered with long, spreading, yellowish-brown, bristly hairs; stipules peltate, ciliate at the margins; keel with an upward-directed conical pocket on the left-hand side; pods 10–14-seeded, ascending at first but sagging later, somewhat constricted between the seeds, bristly pubescent, 4–9 cm long; seeds up to 4·2 mm long, rim-aril not developed.

A cultivated plant, 'Mung' or 'Green gram', occasionally found as an escape in land formerly cultivated, up to 4800 ft. MUM, MAC.

Scott Elliot 6993; Bogdan 3092.

17. Vigna macrorhyncha (*Harms*) *Milne-Redhead* (*Phaseolus schimperi* Taub.; *P. macrorhynchus* Harms; *P. stenocarpus* Harms; *Vigna proboscidella* Chiov.)

Perennial twiner with a thick rootstock; stems glabrous or sparsely pubescent; stipules truncate at the base; leaflets entire, glabrous or sparsely hairy at the margins, with translucent veins; inflorescence lax, 2–7 cm long; pedicels 2–5 mm long; bracteoles ovate-lanceolate, persistent; calyx glabrous except at the margin; tube 2–3 mm long; lobes triangular, up to 2·5 mm long, the upper pair united, or almost so; corolla glabrous, pinkish-mauve, 9–13 mm long; keel with a long beak incurved through almost 360°; pods 8–15-seeded, spreading, glabrous, 5–11 cm long; seeds up to 6 mm long, hilum very small with a minute caruncle.

Uncommon plant found in grassland, especially among rocks and at forest margins, up to 5700 ft. KIT, MUM, KIS, KAJ.

Brodhurst-Hill 223; Tweedie 2002.

18. Vigna monophylla *Taub.* (*Haydonia monophylla* (Taub.) Wilczek) (see p. 274)

An erect, tufted herb from a tuberous or rhizomatous rootstock with glabrous, lanceolate to ovate leaves and head-like condensed racemes on very long peduncles which exceed the leaves; flowers yellow and mauve.

Locally common, in wooded grassland. KIT, MUM.

Bogdan 4067.

19. Vigna triphylla (*Wilczek*) *Verdc.* (*Haydonia triphylla* Wilczek)

A trailing, twining glabrescent herb with oblong leaflets and winged peduncles bearing heads of purple to pink flowers.

Only recorded from one specimen, 4500 ft. MUM.

Whyte, May 1900.

27. SPATHIONEMA *Taub.*

Woody climbers with pinnately trifoliolate stipellate leaves and axillary false racemes; calyx bell-shaped, 5-lobed, the upper pair of lobes joined; corolla green and purple; stamens (9) + 1, the 5 longer filaments dilated apically; anthers uniform; ovary 2–3-ovuled; style slender below, thickened above and bearded inside; pods oblong, not septate.

Spathionema kilimandscharicum *Taub.*

A woody climber with long-petiolate, often fasciculate leaves bearing ovate, emarginate leaflets; flowers blue-purple.

Locally common in *Commiphora* bushland. MAC.

Bogdan 3611.

28. SPHENOSTYLIS *E. Mey.*

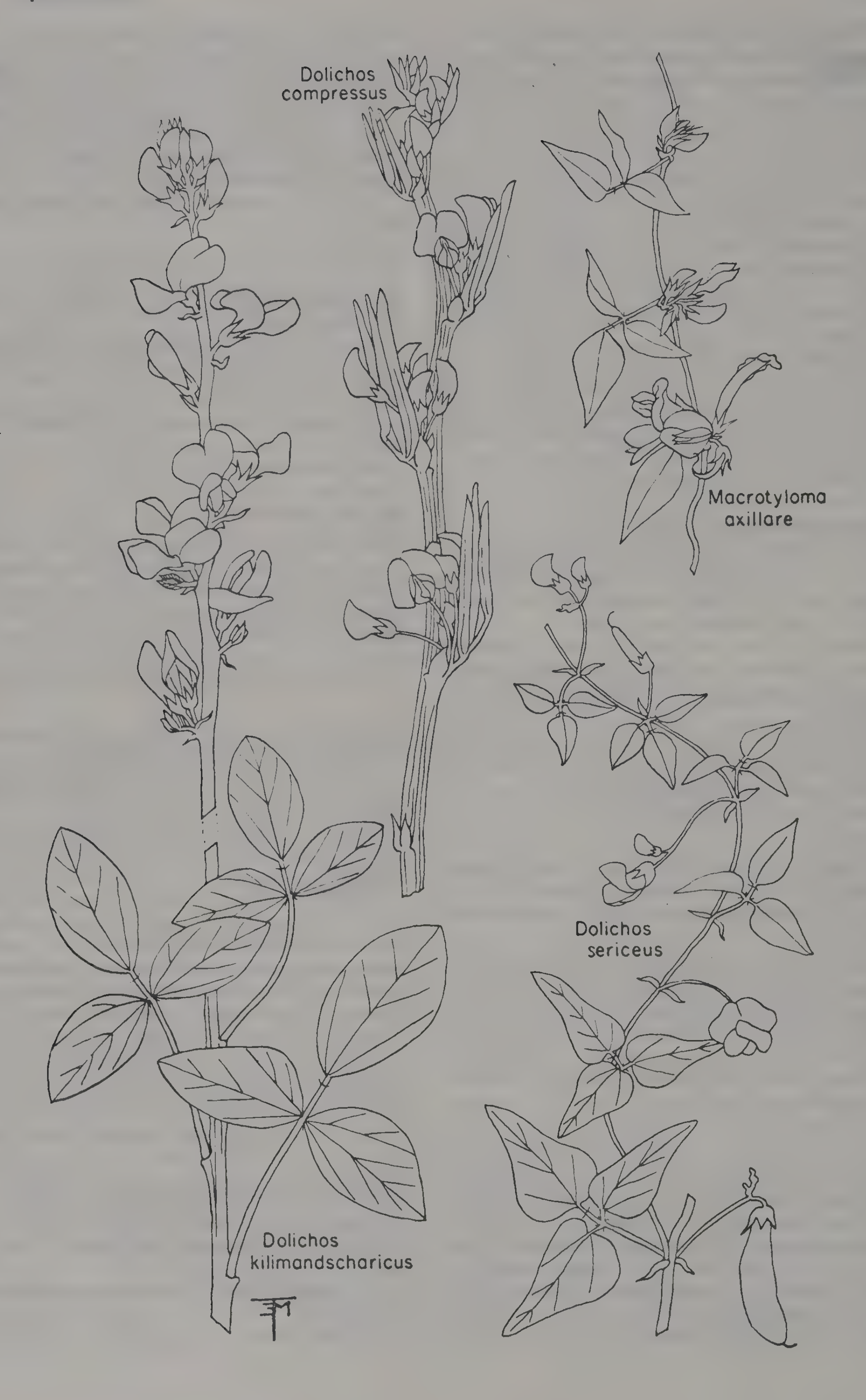
Herbs or shrubs, climbing or not, with pinnately trifoliolate stipellate leaves and axillary false racemes; calyx 5-lobed, 2-lipped; stamens (9) + 1; 5 dorsifixed anthers alternating with 5 basifixed ones; ovary many-ovuled; style ± twisted, thickened basally, thin near the middle and then enlarged, flattened and spathulate near the apex, pubescent; pods linear, compressed, 5–many-seeded, ± septate.

Sphenostylis stenocarpa (*A. Rich.*) *Harms*

A glabrescent twining herb with lanceolate, acute leaflets and pedunculate groups of large showy pink, purple, and cream flowers.

Uncommon plant found in wooded grassland. KIT, MUM.

Bogdan 3544.


Dolichos compressus
Macrotyloma axillare
Dolichos sericeus
Dolichos kilimandscharicus

29. DOLICHOS *L.*

Climbing or erect herbs with pinnately trifoliolate stipellate leaves and axillary fascicles of yellow or purple flowers; calyx 5-lobed; corolla glabrous; corolla standard often with 2 mm long oblong appendages; corolla keel not twisted but often beaked; stamens (9) + 1; anthers uniform; ovary 3–12-ovuled; style swollen, tapering from the base, often twisted, usually glabrous and with a ring of hairs around the terminal capitate stigma; pods straight or curved, compressed.

1 Leaflets oblong-elliptic to ovate; (if linear-oblong then clearly 1-nerved from the base) with pinnate spreading venation 2
Leaflets narrowly elliptic to linear-oblong, prominently 3-nerved from the base 6. *D. compressus*
2 Flowers in umbel-like heads on a 4–20 cm long peduncle 1. *D. luticola*
Flowers in axillary fascicles or in false racemes; peduncles mostly shorter 3
3 Erect herbs or shrubs or woody scramblers 5
Climbers or scramblers with herbaceous stems 4
4 Bracteoles up to 1·5 mm long, 1–3-nerved 2. *D. trilobus*
Bracteoles over 1·5 mm long, 3–7-nerved 3. *D. sericeus*
5 Bracteoles 5-nerved 4. *D. oliveri*
Bracteoles 1–3-nerved 5. *D. kilimandscharicus*

1. Dolichos luticola *Verdc.*

A small pubescent perennial herb with ovate-elliptic leaflets and long-peduncled umbels of mauve or purple flowers.

Locally common in black-cotton soil around Nairobi. MAC, NBI, KAJ.

Verdcourt 3008.

2. Dolichos trilobus *L.*

A pubescent twiner with ovate leaflets and small, solitary, pedunculate, mauve flowers.

Uncommon plant found in stony grassland in western Kenya. MUM.

Tweedie 1545.

3. Dolichos sericeus *E. Mey.* (see p. 280)

Similar to *D. trilobus* but with larger (over 12 mm long) and more numerous flowers, and usually larger in other parts as well.

This is a very variable species with distinct forms which appear not to intergrade in some places. Variation occurs in the hairiness and size of all parts, and the pods vary in shape and size.

Common in evergreen and montane forest edges and clearings. HE, HC, HT, HM, HA, KIT, MUM, NAR, RV, EMB, NBI, KAJ.

Gillett 17314.

4. Dolichos oliveri *Schweinf.*

An erect, silky-hairy shrub or woody herb from a tuberous rootstock with broadly ovate to rhomboid leaflets and solitary attractive blue flowers.

Locally common in dry bushland, especially where disturbed. KIT, MUM, NAR, BAR, RV, MAG, NAN, MAC, KAJ.

Tweedie 1916.

5. Dolichos kilimandscharicus *Taub.* (see p. 280)

A robust, tuberous-rooted herb with leafy stems bearing elliptic to suborbicular leaflets and terminal, often leafless false racemes of purple flowers.

Common in *Combretum* wooded grassland, especially in the Central Province of Kenya. HA, EMB, MAC, NBI, KAJ.

Bogdan 2884.

6. Dolichos compressus *Wilczek* (see p. 280)

An erect pubescent herb with linear leaflets often held upright and fascicles of pedicellate purple flowers.

Uncommon plant found in wooded grassland or bushland in western Kenya. KIT, MUM.

Tweedie 383.

30. MACROTYLOMA (*Wight & Arn.*) *Verdc.*

Herbs similar to *Dolichos* but with yellow-green flowers, very narrow corolla wings, and a filiform, pubescent, but not bearded style.

1 Climbers 2
Erect herbs 5. *M. stipulosum*
2 Lower paired stipels (subtending leaflets at tip of petiole) 4–8 mm long, often twice as long as lateral petiolules 6. *M. maranguense*
Lower paired stipels 1–3 mm long, usually not twice as long as lateral petiolules 3
3 Pods up to 5·5 mm wide 4
Pods over 5·5 mm wide 5
4 Calyx teeth, at least the lower ones, 4–6 mm long; plant hairy 1. *M. uniflorum*
Calyx teeth all 1–3 mm long; plant glabrescent 3. *M. africanum*
5 Lower and lateral sepals attenuate into a hair-like point; flowers up to 10 mm long 2. *M. daltonii*
Lower and lateral sepals acuminate but without a hair-like point; flowers over 12 mm long 4. *M. axillare*

1. Macrotyloma uniflorum (*Lam.*) *Verdc.*

A pubescent twiner with elliptic leaflets and yellow flowers.

Locally common in hot, dry bushland. MAG, MAC.

Bogdan 3481.

2. Macrotyloma daltonii (*Webb*) *Verdc.*

Similar to *M. uniflorum* but with larger leaflets.

Uncommon plant found in dry bushland. KAJ.

Bally 96.

3. Macrotyloma africanum (*Wilczek*) *Verdc.*

Similar to *M. uniflorum* but glabrescent and with more ovate leaflets.

Uncommon plant found in wooded grassland. KIT.

Brodhurst-Hill 438.

4. Macrotyloma axillare (*E. Mey.*) *Verdc.* (see p. 280)

Similar to *M. uniflorum* but with rather larger flowers.

In evergreen forest edges and bushland at medium altitudes. HE, HT, HA, KIT, NAR, RV, MAC, KAJ.

Napper 422.

5. Macrotyloma stipulosum (*Bak.*) *Verdc.*

A pubescent herb from a woody rootstock with oblanceolate leaflets and shortly peduncled clusters of large yellow flowers.

Rare plant found in wooded grassland. HC, HT, KIT.

Symes 59.

6. Macrotyloma maranguense (*Taub.*) *Verdc.*

A pubescent perennial twiner from a woody rootstock with elliptic leaflets and long-pedunculate false racemes of small yellow flowers.

Uncommon plant found in dry grassland. MAC.

van Someren 30.

31. LABLAB *Adans.*

Climbing herbs with pinnately trifoliolate stipellate leaves and axillary, falsely racemose inflorescences; calyx bell-shaped, 2-lipped; corolla small, red to purple or white; standard with thickenings on the inner face; stamens (9) + 1; anthers uniform; ovary many-ovuled; style flat, parallel-sided, hairy within; pod oblong, compressed, with spongy divisions within; seeds ovoid.

Lablab purpureus (*L.*) *Sweet* (see p. 269)

A pubescent climber with ovate acute leaflets and axillary spikes of fascicles of pink and purple flowers.

This plant is frequently cultivated for its beans, but appears wild in riverine forest edges in dry country. HE, HT, KIT, MUM, NAR.

Tweedie 346.

32. NEORAUTANENIA *Schinz*

Prostrate, erect or climbing herbs with pinnately trifoliolate stipellate leaves and axillary false racemes or panicles of purplish flowers; bracts soon falling; bracteoles absent; calyx 5-lobed, 2-lipped; corolla rather small with long-spurred wings; stamens (9) + 1; anthers uniform; ovary 3–8-ovuled with a thickened glabrous swelling at the style base; style thickened below, angled, glabrous; pods linear-oblong, dehiscent, septate; seeds 3–8, compressed.

Neorautanenia mitis (*A. Rich.*) *Verdc.*

An erect woody herb or climber with entire or 3-lobed, ovate leaflets and simple or branched spikelike false racemes of purple flowers.

Locally common in dry bushland; very variable in leaf shape and indumentum. KIT, BAR, RV, MAG.

Mathenge 72.

33. CAJANUS *DC.*

Shrubs with pinnately 3-foliolate stipellate leaves gland-dotted; inflorescence a terminal panicle of subcapitate racemes; bracts present; bracteoles absent; calyx 5-lobed, the upper pair joined; standard petal auriculate; stamens (9) + 1; all anthers similar; ovary 4–6-ovuled; style thickened above and flattened below the capitate stigma; pod linear-oblong, inflated, with a long-persistent apex, 3–7-seeded.

Cajanus cajan (*L.*) *Millsp.*

An erect shrubby herb with elliptic leaflets and yellow and orange flowers.

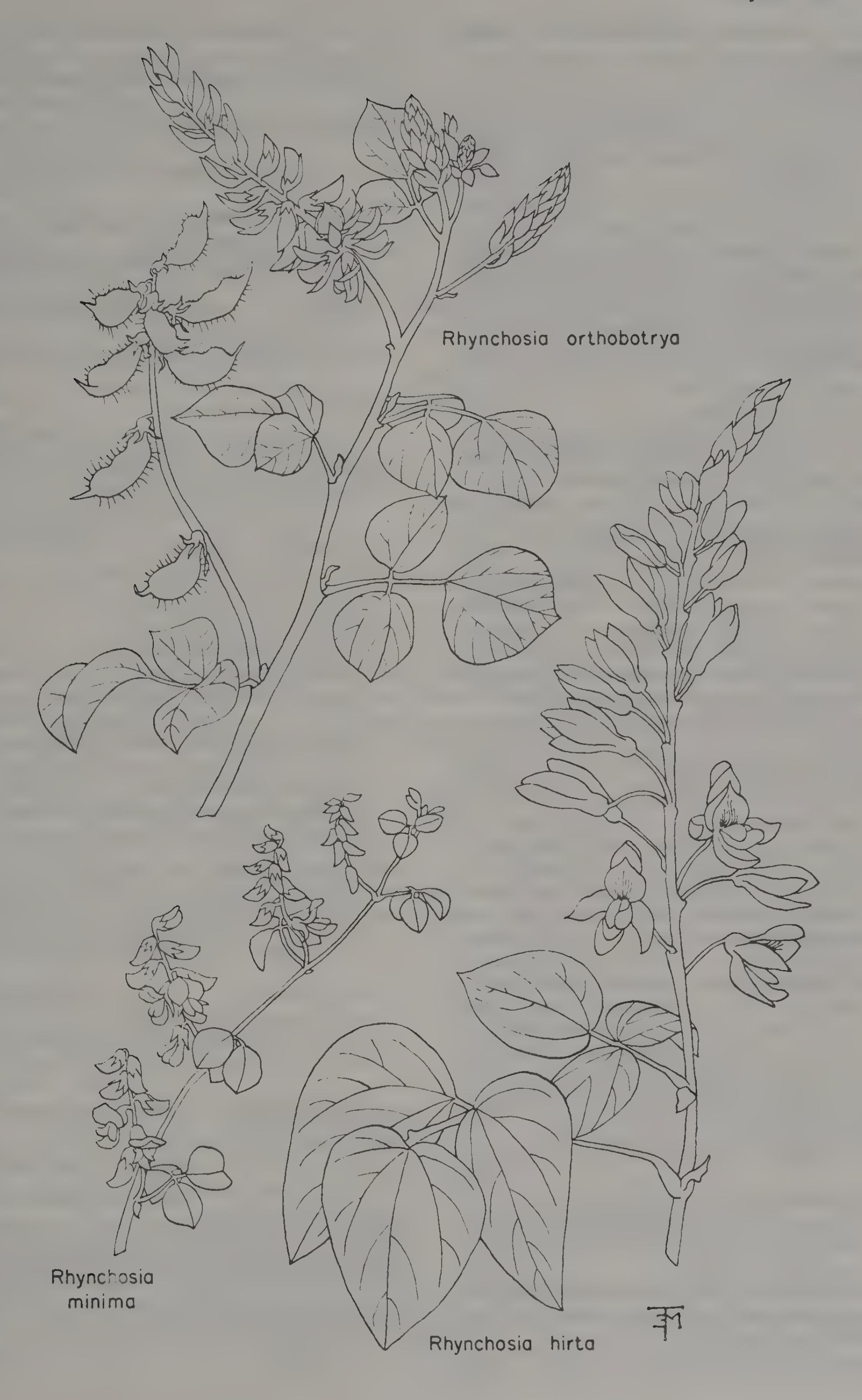
This is the pigeon pea, widely cultivated in dry country and recorded as an escape. NBI.

Napier 1828.

34. RHYNCHOSIA *Lour.*

Climbing, prostrate or erect herbs or shrubs with pinnately trifoliolate or simple stipellate leaves gland-dotted below; inflorescences mostly axillary, racemose; bracts present; bracteoles absent; calyx 5-lobed, the upper pair ± joined; standard petal auricled; stamens (9) + 1 with all anthers similar; ovary 1–2-ovuled; style hairy below; pods circular to oblong, flat or rarely inflated, 1–2-seeded; seeds reddish-brown to blue-black.

1 Flowers usually appearing before the leaves; leaflets deeply lobed 9. *R. pulchra*


Rhynchosia orthobotrya
Rhynchosia minima
Rhynchosia hirta

Flowers and leaves present together; leaflets ± entire 2
2 Leaflets 3 3
Leaflets 1 14. *R. alluaudii*
3 Flowers in dense, ± sessile inflorescences, not very sticky; sepals with conspicuous dark or orange dots 2. *R. densiflora*
Flowers in laxer pedunculate inflorescences or if dense and sessile then very sticky and sepals without dots 4
4 Seeds persistent, globose, blue-black; corolla drying reddish 1. *R. hirta*
Seeds falling, compressed, brown; corolla drying brown 5
5 Erect plants, sometimes scrambling, never twining or prostrate 6
Twining or prostrate plants 9
6 Calyx and undersurface of leaflets covered with dense, greyish-white velvety indumentum which hides the gland dots 16. *R. albissima*
Calyx and leaves not so densely covered with hairs 7
7 Leaflets rhomboid, with long-acuminate or acute apices, distinctly paler beneath; calyx saccate; indumentum yellow and very sticky 4. *R. resinosa*
Leaflets oblate or rounded and very shortly, abruptly apiculate; calyx not saccate 8
8 Inflorescence ± half as long as leaves; fruit softly hairy; hairs up to 1 mm long; stipules ± 4 x 1 mm 7. *R. nyasica*
Inflorescence ± as long as the leaves; fruit with bristly, yellow, 1·5–2 mm long hairs; stipules ± 7 x 2·5 mm 6. *R. orthobotrya*
9 Pods with fine, sparse to dense pubescence of short hairs less than 0·5 mm long without an admixture of longer hairs; stem and inflorescence hairs not, or hardly, sticky-glandular 10
Pods with longer, sometimes sticky hairs in addition to fine pubescence and gland dots; stem hairs sometimes long and glandular; if pod almost without long hairs the inflorescence very glandular and sticky 16
10 Pod inflated, club-shaped 15. *R. sublobata*
Pod compressed 11
11 Calyx as long as or longer than the corolla 19. *R. minima*
Calyx shorter than the corolla 12
12 Corolla ± 1·5 cm long; leaflets with conspicuous grey hairs on the veins (and often elsewhere) beneath 17. *R. holstii*
Corolla up to 1·2 cm long or leaflets glabrescent or very finely pubescent beneath 13
13 Corolla 5–8 mm long 14
Corolla 10–12 mm long 15
14 Calyx pale with conspicuous midribs 19. *R. minima*
Calyx drying purplish with midribs obscure 12. *R. usambarensis*
15 Corolla pale yellow without dark markings 18. *R. malacophylla*
Corolla with red and purple markings 19. *R. minima*
16 Leaflets ± twice as long as wide; inflorescence lax and few-flowered 13. *R. totta*
Leaflets wider and inflorescence often dense 17
17 Pods up to 15 mm long; inflorescences not densely glandular-hairy 18
Pods over 15 mm long or inflorescences with dense yellow glandular hairs 19
18 Stipules over 8 mm long 20. *R. kilimandscharica*
Stipules less than 5 mm long 19. *R. minima*
19 All or some leaflets with pale areas along midrib and main nerves above 12. *R. usambarensis*
All leaflets concolorous 20
20 Calyx asymmetrically saccate 4. *R. resinosa*
Calyx not asymmetrically saccate 21
21 Standard glabrous outside 22
Standard pubescent outside 23
22 Corolla over 16 mm long 8. *R. elegans*
Corolla less than 15 mm long 10. *R. ferruginea*
23 Lowest calyx tooth elliptic-lanceolate, longer and wider than the rest, pod with long yellow glandular hairs 6. *R. orthobotrya*
Lowest calyx tooth similar to the rest, or, if longer, then pod with short greyish hairs 24
24 Some pedicels over 3 mm long; standard pubescent only at apex 3. *R. procurrens*
All pedicels 3 mm long or less; standard pubescent over all exposed exterior part 25
25 Plant ± viscid 5. *R. pseudoviscosa*
Plant without glandular hairs 11. *R. oblatifoliolata*

1. Rhynchosia hirta (*Andrews*) *Meikle & Verdc.* (*R. albiflora* (Sims) Alston) (see p. 283)

A robust twiner with broad leaflets and racemes of dull, white-green flowers; corolla with a crimson flash inside standard.

This plant is handsome in fruit since the blue seeds are exposed in the dehisced but persistent pod. Local but widespread in dry woodland edges and *Combretum* bushland. HE, HA, HK, MUM, KIS, NAR, MAC, NBI, KAJ.

Tweedie 2094.

2. Rhynchosia densiflora (*Roth*) *DC.*

A low, prostrate herb from a wiry rootstock with oblong or suborbicular leaflets and subsessile racemes of yellow flowers.

Locally common in stony grassland. HA, MUM, NAR, RV, MAG, MAC.

Bogdan 1659.

3. Rhynchosia procurrens (*Hiern*) *K. Schum.*

A glandular-hairy, trailing herb with broad, often rhomboid leaflets and large, massive racemes of yellow red-streaked flowers; calyx enlarged in fruit.

Rare and only recorded from wooded grassland in KIT.

Bogdan 3575.

4. Rhynchosia resinosa (*A. Rich.*) *Bak.*

A glandular-hairy, woody twiner with ± triangular leaflets and terminal and axillary racemes of yellow red-streaked flowers.

Locally common in dry, rocky bushland. KIT, BAR.

Tweedie 1914.

5. Rhynchosia pseudoviscosa *Harms*

A pubescent, prostrate or ascending twiner with broadly rhomboid leaflets and racemes of few large flowers; standard yellow, streaked with red.

Rare plant found in stony bushland. MAC.

Goodhart in H 271/62.

6. Rhynchosia orthobotrya *Harms* (see p. 283)

A glandular-hairy, woody herb with ovate leaflets and long spikes of numerous smallish, yellow and red subsessile flowers.

Locally common in western Kenya in wooded grassland. HE, KIT, MUM, KIS, BAR.

Tweedie 1140.

7. Rhynchosia nyasica *Bak.*

A glandular-hairy, erect or trailing herb with rhomboid to ovate-elliptic leaflets and axillary racemes of yellow-green flowers.

Uncommon plant found in dry bushland. HA, EMB.

Graham 2402.

8. Rhynchosia elegans *A. Rich.*

A glandular-hairy twiner with ovate to rhombic leaflets and long racemes of large yellow, flushed reddish-pink, flowers; pods reticulated with dark green.

Locally common in the margins of evergreen woodland. HE, HA, NAR, RV, MAC, NBI.

Williams 490.

9. Rhynchosia pulchra (*Vatke*) *Harms*

An erect silky-hairy, hardly glandular herb with lobed, ovate leaflets and long, axillary, subapical racemes of yellow red-streaked flowers; pods reticulated with darker green.

Uncommon plant found in dry rocky country. MAC.

Scheffler 97.

10. Rhynchosia ferruginea *A. Rich.*

A silky-hairy, hardly glandular, twining herb with ovate to suborbicular leaflets and long racemes of pale yellow brown-streaked flowers.

Locally common in wooded grassland. HE. KIT, RV.

Bogdan 3573.

11. Rhynchosia oblatifoliolata *Verdc.*

A trailing, pubescent, eglandular herb with rhomboid to ovate leaflets and long, few-flowered racemes; flowers yellow with orange-pink standard.

Locally common in dry grassland. HT, KIT, RV, MAC, NBI.

Bogdan 936.

12. Rhynchosia usambarensis *Taub.*

A glandular- and spreading-hairy twining herb with ovate, acute leaflets which have paler and darker green areas and long-pedunculate racemes of orange-yellow flowers.

Locally common in upland grassland and forest edges. HE, HM, HA, KIT, MUM, NAR, RV, MAC, NBI.

Glover and Samuel 3120.

13. Rhynchosia totta (*Thunb.*) *DC.*

A small, pubescent, trailing, and twining herb with oblong, stiff leaflets and 1-3-flowered racemes; flowers yellow and brown.

Locally common in dry stony grassland. MUM, KIS, NAR, BAR, RV, MAG.

Tweedie 2899.

14. Rhynchosia alluaudii *Sacleux*

A pubescent or silky-hairy, tuberous-rooted, erect herb with simple, rounded, ovate to orbicular leaves and short racemes of yellow and red flowers.

Uncommon plant found in rocky grassland and forest edges. NAR, EMB, MAC, NBI, KAJ.

Napier 386.

15. Rhynchosia sublobata (*Schum.*) *Meikle*

A pubescent, twining herb with rhomboid leaflets, the lateral leaflets very asymmetric, often shallowly lobed; racemes loose, of yellow

red-streaked flowers; pods inflated, minutely pubescent.

Locally common in dry country. MAG, NAN, EMB.

Bogdan 3758.

16. Rhynchosia albissima *Gandoger*

A silky-hairy, erect or spreading, woody herb or shrub with orbicular leaflets and subterminal racemes of yellow and purple flowers.

Locally common at the coast but rare in our area, found in bushland. MAC.

Drummond and Hemsley 3763.

17. Rhynchosia holstii *Harms*

A pubescent trailing or twining herb with ovate to rhomboid, often bullate, leaflets and long racemes of yellow red-streaked flowers.

In rocky grassland, particularly around Nairobi. HA, EMB, MAC, NBI.

Bogdan 1488.

18. Rhynchosia malacophylla (*Spreng.*) *Boj.* (*R. senaarensis* Schweinf.)

A pubescent, minutely glandular, trailing or twining, wiry herb with ± orbicular, rather stiff leaflets and long racemes of yellow red-streaked flowers.

A common plant of dry, stony grasslands. BAR, MAG, EMB, KAJ.

Bally 2569.

19. Rhynchosia minima (*L.*) *DC.* (see p. 283)

Similar to *R. malacophylla* but with more ovate and bullate leaflets and the keyed differences.

A rather variable plant common in some upland grasslands. HE, HT, HA, KIT, MUM, NAR, RV, MAC, NBI, KAJ.

Polhill 80.

20. Rhynchosia kilimandscharica *Harms.*

A minutely pubescent twining or trailing herb with ovate or rhomboid leaflets and long-pedunculate racemes of small yellow red-streaked flowers.

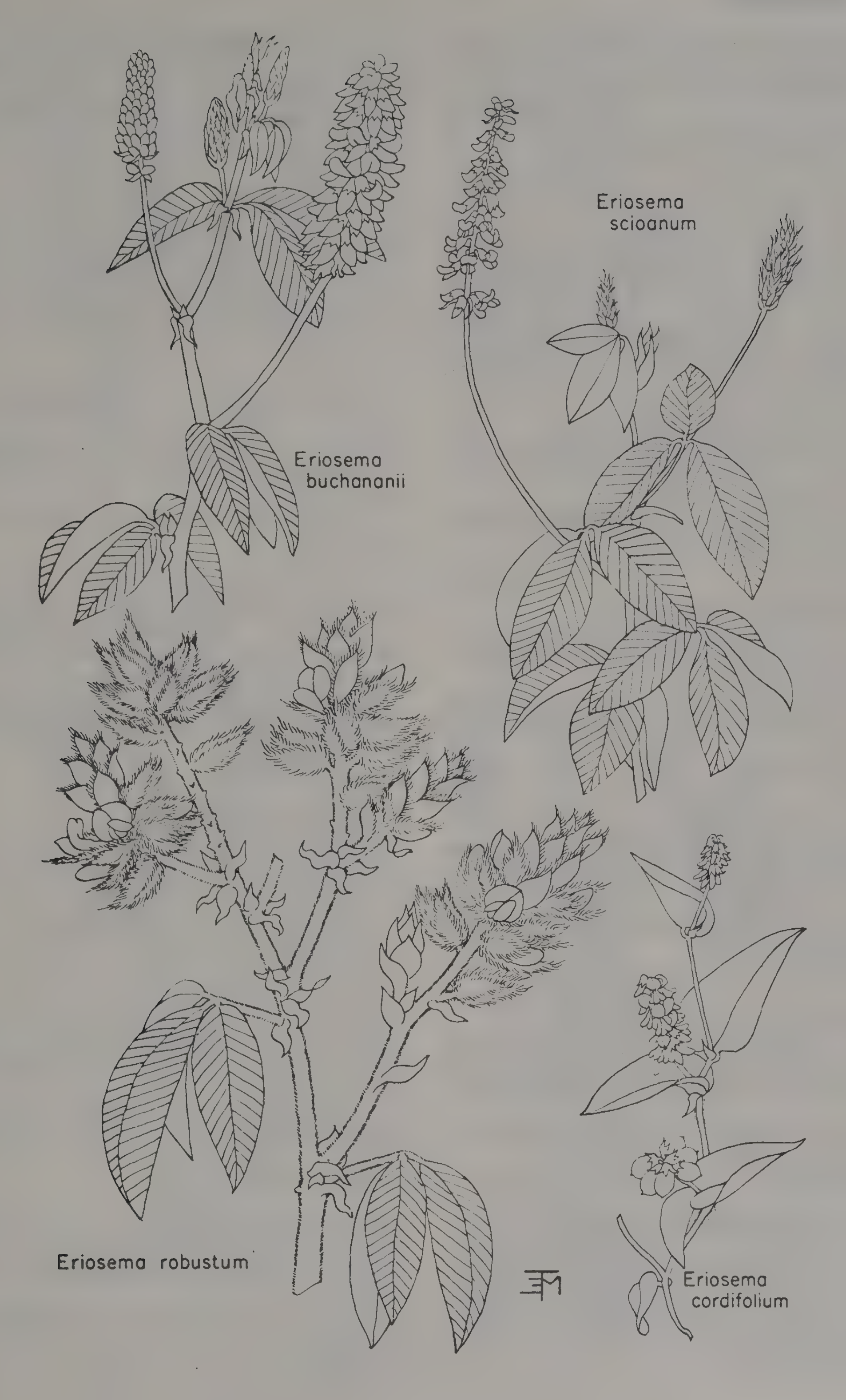
Locally common in montane forest edges. HE, HM, HA, HK, KIT, NBI, KAJ.

Tweedie 721.

35. ERIOSEMA (*DC.*) *Desv.*

Herbs or shrubs, sometimes tuberous, with mostly pinnately trifoliolate or rarely simple leaves gland-dotted below; stipels mostly absent; flowers yellow or brown in axillary (rarely terminal) racemes or spikes; bracts present; bracteoles absent; calyx 5-lobed, the upper pair fused or free; stamens (9) + 1; anthers all similar; ovary 2-ovuled, hairy; style bent at or below the middle, glabrous above; pods oval or oblong, flat, usually silky-hairy; seeds 2.

1 Flowers present before the leaves — 2
  Flowers and leaves (even if young) present at the same time — 3
2 Raceme dense with flowers touching each other — 14. *E. rhodesicum*
  Raceme lax with flowers separated from each other — 13. *E. sparsiflorum*
3 Leaves all simple — 4
  Leaves 3-foliolate, except sometimes at base — 5
4 Leaves cordate at base — 17. *E. cordifolium*
  Leaves acute to rounded at base — 14. *E. rhodesicum*
5 Stem flattened; often some leaves more than 3-foliolate — 4. *E. vanderystii*
  Stems not flattened; all leaves 3-foliolate — 6
6 Leaf petiole longer than 15 mm — 15
  Leaf petiole shorter than 10 mm — 7
7 Bracts equalling or longer than the corolla at anthesis — 8. *E. jurionianum*
  Bracts shorter than the corolla at anthesis — 8
8 Rachis of raceme over 3 cm long — 9
  Rachis of raceme less than 3 cm long — 12
9 Leaves oblanceolate, rounded at apex; peduncle less than half the length of the rachis of the raceme — 3. *E. psoraleoides*
  Leaves elliptic to oblanceolate, usually acute; peduncle over half the length of the rachis of the raceme — 10
10 Flowers and fruits crowded, touching one another; internodes of inflorescence less than 5 mm long — 11
  Flowers and fruits well spaced, not touching one another; internodes of inflorescence over 5 mm long — 13. *E. sparsiflorum*
11 Stipules over 3 mm wide — 6. *E. buchananii*
  Stipules under 2 mm wide — 5. *E. nutans*
12 Flowers more than 15, crowded in a ± spherical head — 2. *E. glomeratum*
  Flowers fewer than 12, in a short, loose raceme — 13
13 Plant with a rhizomatous rootstock; leaflets acute at apex — 16. *E. shirense*
  Plant with a woody rootstock; leaflets obtuse at apex — 14
14 Upper leaf surface with lateral veins prominent or flat — 15. *E. elliotii*
  Upper leaf surface with grooves over the lateral veins — 1. *E. bogdanii*
15 Plant a herb from an underground tuber; stipules green — 12. *E. macrostipulum*
  Plant shrubby; stipules brown — 16
16 Median floral bracts over 7 mm wide — 11. *E. robustum*
  Median floral bracts under 4 mm wide — 17


Eriosema scioanum
Eriosema buchananii
Eriosema robustum
Eriosema cordifolium

17 Bracts in two series, the lowest sterile, broad, ± persistent, forming a cone-like base to the raceme, the upper narrow, caducous — 10. *E. flemingioides*
All bracts similar, narrow — 18
18 Claw of keel shorter than the lamina — 7. *E. montanum*
Claw of keel equal to or exceeding the lamina — 19
19 Spikes ovoid; bracts equalling or longer than the flowers; corolla scarcely exceeding the calyx — 8. *E. jurionianum*
Inflorescences cylindrical; bracts shorter than the flowers; corolla much longer than the calyx — 9. *E. scioanum*

1. Eriosema bogdanii *Verdc.*

An erect, tomentose herb from a woody rootstock with rounded, elliptic leaflets and short axillary spikes of few yellow flowers.

So far only found in burnt grassland in EMB, 15 miles south of Meru.

Bogdan 3754.

2. Eriosema glomeratum *Hook. f.*

An erect, spreading-hairy, woody herb with mostly elliptic leaflets and small, shortly pedunculate heads of yellow flowers.

Plentiful at the coast in bushed grassland but only recorded by one collection from Thika in our area. MAC.

Bogdan 2885A.

3. Eriosema psoraleoides (*Lam.*) *G. Don.*

A pubescent, erect, woody herb with rounded, oblanceolate to cuneate leaflets and long axillary racemes of yellow flowers.

Locally common in disturbed rocky bushland. MUM, KIS, EMB, MAC.

Tweedie 1499.

4. Eriosema vanderystii (*de Wild.*) *Hauman*

An erect, velvety-hairy herb from a woody rootstock with linear-lanceolate to oblong leaflets and a terminal panicle of crowded racemes of yellow flowers.

Locally common in wet marshy grassland in western Kenya. MUM.

Tweedie 2882.

5. Eriosema nutans *Schinz.* (see p. 289)

An erect, tomentose herb from a wiry rhizomatous rootstock with lanceolate to elliptic leaflets and dense cylindrical racemes of small yellow flowers.

Common in wooded grassland and forest edges. HT, HA, KIT, RV, MAC.

Bogdan 2102.

6. Eriosema buchananii *Bak. f.* (see p. 287)

Very similar to *E. nutans* but more spreading-hairy and with larger leaflets.

Uncommon, in upland wooded grassland. HK, KIT, KAJ.

Napier 1971.

7. Eriosema montanum *Bak. f.*

An erect, sparsely hairy, shrubby herb with ovate, acute or acuminate leaflets and cylindrical racemes of small yellow flowers.

Locally common in wooded grassland. HC, HM, KIT, MUM, KIS.

Symes 203.

8. Eriosema jurionianum *Stan. & De Craene* (see p. 289)

Similar to *E. montanum* but more densely hairy and with elliptic leaflets and ovoid spikes; flowers brown and yellow.

Locally common at upland forest edges. HE, HT, HA, HK, RV.

Irwin 127.

9. Eriosema scioanum *Avetta* (see p. 287)

A sparsely hairy, rhizomatous herb with ascending stems and elliptic, acute leaflets; spikes cylindrical, of small orange and brown flowers.

Locally common in montane forest clearings and upland grassland. HE, HT, HM, HA, KIT, KIS, MAC, NBI, KAJ.

Tweedie 218.

10. Eriosema flemingioides *Bak.*

A pubescent, woody shrub with broadly elliptic, apiculate leaflets and a terminal panicle of spikes of yellow and reddish-brown flowers.

In wet, wooded grassland, only just entering our area near the Uganda border. MUM.

Tweedie 3582.

11. Eriosema robustum *Bak.* (see p. 287)

A pubescent perennial shrubby herb with elliptic acute leaflets and a very hairy inflorescence; corolla yellow.

Locally common and conspicuous, in wooded grassland especially around Kitale. HA, KIT, KIS, RV.

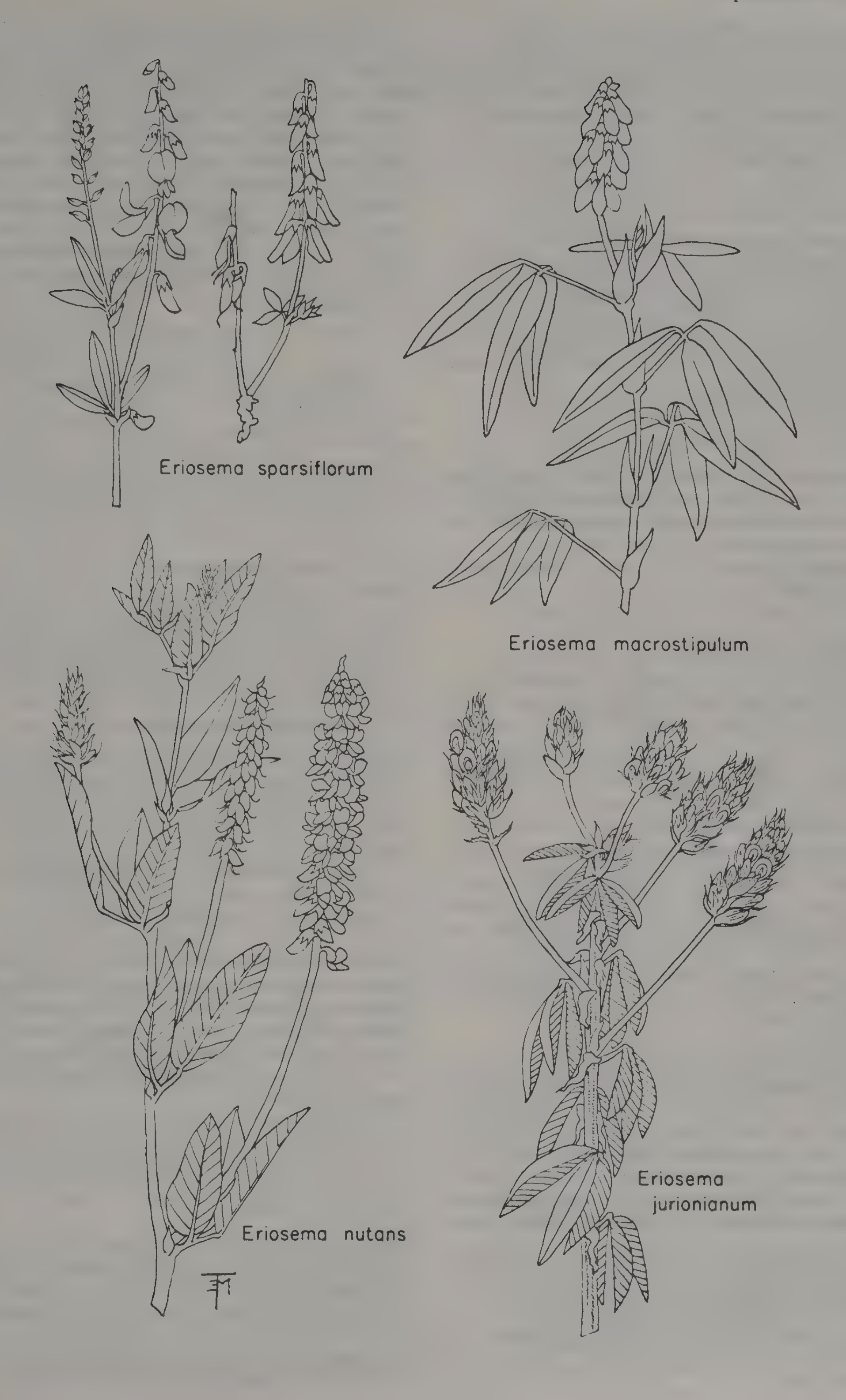
Tweedie 2911.

12. Eriosema macrostipulum *Bak. f.* (see p. 289)

An erect pubescent herb from a buried tuber with lanceolate leaflets and small racemes of yellow flowers.

Locally common in bushed grassland. HE, HC, HM, KIT.

Wiltshire 46B.


Eriosema sparsiflorum
Eriosema macrostipulum
Eriosema nutans
Eriosema
jurionianum

13. Eriosema sparsiflorum *Bak. f.* (see p. 289)

A pubescent herb with erect stems from a woody rootstock and oblong to elliptic leaflets; racemes lax and long-pedunculate; flowers yellow and reddish-brown.

Locally common in western Kenya. HE, KIT, MUM.

Lugard 567.

14. Eriosema rhodesicum *R. E. Fr.*

A pubescent herb with erect stems from a woody rootstock; leaves simple, linear-elliptic to lanceolate; racemes of rather crowded yellow and red flowers appearing before leaves or below them.

Uncommon plant found in short burnt grassland in western Kenya. HC, KIT.

Tweedie 3258.

15. Eriosema elliotii *Bak. f.*

A silky-hairy herb with prostrate or ascending stems from a woody rootstock and obovate to elliptic leaflets; flowers yellow, in inconspicuous few-flowered racemes.

Uncommon plant found in dry upland grassland. HT, KIT.

Bogdan 1706.

16. Eriosema shirense *Bak. f.*

A spreading-hairy rhizomatous herb with erect stems and linear-elliptic leaflets; racemes short, hidden within the leaves; flowers yellow, streaked with red.

Locally common in wooded grassland. EMB, MAC, KAJ.

Bally 8265.

17. Eriosema cordifolium *A. Rich.* (see p. 287)

A pubescent herb with ascending stems from a buried tuber and simple ovate, cordate, subsessile leaves; racemes spike-like, cylindrical, of pink and yellow flowers.

Uncommon plant found in short upland grassland. HE, HT.

Williams 204.

36. FLEMINGIA *Ait. f.*

Herbs or shrubs with digitately trifoliolate glandular leaves without stipels and axillary and terminal, racemose or paniculate inflorescences; calyx 5-lobed, the lobes longer than the tube; corolla small, green or yellow; stamens (9) + 1; anthers all similar; ovary 2-ovuled; style filiform, enlarged above; pods ovoid-oblong, inflated; seeds globose.

Flemingia grahamiana *Wight & Arn.* (*Moghania grahamiana* (Wight & Arn.) O. Ktze)

A stiff herb or shrub, dealt with in KTS p. 371.

Locally common in wooded grassland. HE, KIT, EMB.

Bogdan 3499.

37. LOTONONIS *Eckl. & Zeyh.*

Low herbs, with basifixed or slightly 2-armed hairs; leaves digitately 3-foliolate; stipules solitary or paired; stipels absent; flowers in subsessile or pedunculate terminal and leaf-opposed racemes or clusters, rarely solitary, rather small, yellow; calyx 5-lobed, the 4-upper lobes more united than the narrow lower lobe; keel rounded at the tip; stamens united into a sheath split along the upper side, 4 with long and 6 with short anthers; ovary sessile; pod oblong, usually pointed, only slightly inflated; seeds small, numerous.

1 Annual, covered with long fine spreading hairs — 1. *L. platycarpos*
  Perennial with the hairs short and appressed or lacking — 2
2 Stems creeping, practically glabrous; flowers 6–50 in dense racemes — 2. *L. angolensis*
  Stems erect or spreading, densely silvery-pubescent; flowers 1–5, subumbellate — 3. *L. laxa*

1. Lotononis platycarpos (*Viv.*) *Pic.-Serm.*

Small creeping hairy annual, with inconspicuous flowers clustered opposite many of the leaves; pod straight, 5 mm long, scarcely exceeding calyx.

Common in dry open places throughout RV.

Bogdan 3048; Verdcourt 1794.

2. Lotononis angolensis *Bak.*

Many-stemmed subglabrous creeping perennial, with numerous small flowers crowded at the top of the ultimately 2–6 cm long ascending peduncles; pods slightly curved, pointed, 1·5–1·8 cm long.

Short grassland, often in disturbed places. MUM, EMB, MAC, NBI.

Bally 7801; Verdcourt 508.

3. Lotononis laxa *Eckl. et Zeyh.*

A low perennial, with many slender spreading-ascending stems, clothed with short appressed slightly biramous hairs; flowers 1–5 at top of a short peduncle, yellow, turning reddish with age, 7–9 mm long; pod straight, pointed, 1·5–2 cm long, pubescent.

Uncommon plant found in dry grassland, usually of mountains and scarps. RV, HA, NBI.

Dowson 269; Verdcourt 3457A.

38. CROTALARIA *L.*

Herbs or shrubs; leaves simple or digitately (1–)3(–7)-foliolate; stipels absent; flowers in terminal, leaf-opposed or rarely axillary racemes, occasionally solitary or in axillary clusters; calyx (3-4-)5-lobed, the lobes generally subequal but occasionally forming 2 lips; petals usually yellow, variously marked, less commonly blue or white,

sometimes pubescent particularly on the standard outside; keel generally produced into a prominent beak; stamens all united into a sheath open at least at the base, 5 with basifixed anthers alternating with 5 with smaller dorsifixed anthers; pod inflated (in our area), dehiscent, the seed-bearing part supported within the calyx by a very short to long stalk (stipe); seeds with a distinct hilar sinus, occasionally with a small white aril.

1 Leaves 3–5-foliolate — 2
Leaves simple or 1-foliolate — 73
2 Plant spiny — 62. *C. spinosa*
Plant not spiny — 3
3 Petals of open flowers blue — 4
Petals yellow or white except for markings — 5
4 Keel 1·6–1·8 cm long; pod (3·5–)4–4·5 cm long; plant erect — 8. *C. polysperma*
Keel 1·1–1·4 cm long; pod 2·5–3·2 cm long; plant spreading — 9. *C. serengetiana*
5 Bracts fused to pedicel, the free part spreading from just below the calyx, 3-fid; stipules 1–5-fid; flowers in dense heads — 21. *C. ononoides*
Bracts at base of pedicel simple; stipules, if present, not divided — 6
6 Stipules resembling small leaflets, very shortly stalked, linear-lanceolate to ovate; keel abruptly rounded to angular, often with white woolly indumentum along upper margin; bracts often soon shed — 7
Stipules linear, narrowly wedge-shaped or lacking — 12
7 Stipules heart-shaped, equal-sided, 6–12 mm wide — 12. *C. stolzii*
Stipules linear-lanceolate to curved-oblong, basally narrowed or truncate, very unequal-sided — 8
8 Ovary and legume glabrous — 9
Ovary and legume hairy — 10
9 Perennial, generally erect, shortly hairy; stipules basally narrowed; standard suborbicular — 13. *C. natalitia*
Annual, spreading, hirsute; stipules basally truncate; standard ovate — 16. *C. podocarpa*
10 Keel 1·8–2·5 mm long; pod coarsely furry — 17. *C. lachnophora*
Keel up to 1·5 cm long; pod shortly and finely hairy — 11
11 Calyx 6–10 mm long; pod cylindrical, 2·3–3 cm long; petioles mostly 1·5–3·5 cm long — 14. *C. cylindrocarpa*
Calyx 4–5 mm long; pod oblong-ellipsoid, 1·5–2 cm long; petioles mostly 3·5–6·5 cm long — 15. *C. goreensis*
12 Flowers clustered in the axils, 1·5–2 cm long — 13
Flowers, unless much smaller, in terminal and leaf-opposed racemes — 14
13 Pod 8–14 mm across; indumentum usually yellowish, sparse or crisped on the leaflets beneath — 51. *C. axillaris*
Pod 20–26 mm across; indumentum silvery, short, appressed and rather dense on the leaflets beneath — 52. *C. scassellatii*
14 Calyx effectively 3-lobed, with upper and lateral lobes joined on either side almost to tips, 1·2–3 cm long — 15
Calyx 5-lobed, with lobes free at maturity, although sometimes slightly adherent at tips in young flowers — 17
15 Keel gradually produced into a short projecting beak, 3·5–5·5 cm long; calyx 1·8–3 cm long — 1. *C. agatiflora*
Keel abruptly contracted into an upwardly directed beak, 2·5–3·5 cm long; calyx 1·2–2 cm long — 16
16 Leaflets elliptic, mostly 4–9 cm long, shortly hairy beneath — 2. *C. lebrunii*
Leaflets very reduced, narrowly oblong to obovate, less than 1 cm long, glabrous — 4. *C. pseudospartium*
17 Keel strongly rounded, ± straight along upper edge, abruptly contracted into an upwardly directed straight ± truncate beak, 2–3 cm long, much exceeding the wings; pod with slender stipe half or more than half as long as the seed-bearing part — 3. *C. laburnifolia*
Keel less abruptly produced into a beak or much smaller; stipe of pod much less than half length of seed-bearing part — 18
18 Upper calyx-lobes suboblong, abruptly terminating in an eccentric tip, or lanceolate to ovate, narrowed to the base, about as long as the corolla — 19
Upper calyx-lobes triangular or wedge-shaped, broadest at the base (or just above in Nos. 5, 11) — 21
19 Upper calyx-lobes practically oblong, subtruncate, densely covered with short brownish hairs — 6. *C. mauensis*
Upper calyx-lobes lanceolate to ovate, sparsely provided with long whitish hairs — 20
20 Keel abruptly rounded about the middle; standard glabrous outside; pod 3·5–6·5 times as long as broad — 7. *C. quartiniana*
Keel angled in the lower half; standard hairy outside; pod 2–2·5 times as long as broad — 10. *C. barkae*
21 Keel rounded about the middle, sometimes rather abruptly so, with a variously developed and orientated beak — 22
Keel angled in the lower half, with a straight rather narrow beak — 54


Crotalaria cylindrica
Crotalaria lachnocarpoides
Crotalaria lachnophora
Crotalaria orthoclada
Crotalaria natalitia

22 Bracteoles curved up like 2 horns from just below calyx; shrubby, with relatively small membranous elliptic to obovate leaflets and the flowers few on thread-like axes 5. *C. goodiiformis*
Bracteoles not curved up like horns 23
23 Keel semi-orbicular, shortly beaked, with a sparse band of hairs on sides towards lower margin; pod shortly cylindrical, 2·5–3 cm long, densely furry; leaflets felty-tomentose 18. *C. lachnocarpoides*
Keel without a band of hairs on surfaces away from lower margin 24
24 Standard extensively pubescent outside (at least medially) 25
Standard glabrous outside, except sometimes for a few hairs along the mid-vein and at the apex 27
25 Petioles 2–5(–10) mm long; leaflets oblanceolate; keel about as long as wings 19. *C. orthoclada*
Petioles up to 40–90 mm long; leaflets elliptic to obovate; keel much shorter than wings 26
26 Keel 11–13 mm long; calyx of mature flowers 10–12 mm long; pod 24–36-seeded 22. *C. verdcourtii*
Keel 6–8 mm long; calyx 8–10 mm long; pod 16–20-seeded 23. *C. deflersii*
27 Beak of keel with a spiral twist (look for diagonal course of seam and veins); keel 1–2 cm long; pod oblong-club-shaped, 2·5–6·5 cm long 28
Beak of keel not twisted (discount withered flowers). (In 37. *C. cleomifolia* and 42. *C. ukambensis* the rather long narrow incurved beak of older flowers may become slightly and irregularly twisted as a whole in a corkscrew fashion (at least when dried), but this is quite unlike the integral spiral twist running from base to apex of beak in the other group). 31
28 Ovary and pod glabrous; wings enveloping keel; petioles flattened, broadly grooved 55. *C. recta*
Ovary and pod shortly hairy; wings about as long as keel, but not wrapped around it; petioles slender 29
29 Leaves (on all but youngest branches) mostly subtending very short lateral shoots bearing clusters of smaller leaves; branches rather persistently tomentose 53. *C. fascicularis*
Leaves not in tufts; branches with a short appressed indumentum, more or less glabrescent 30
30 Bracts 3–9 mm long, soon falling; calyx 8–11 mm long, with a conspicuous white fringe of woolly hairs along inside margin of lobes; pod 5–6·5 cm long 49. *C. tabularis*
Bracts 1–3 mm long, persistent; calyx 5–8 mm long, without a white fringe to lobe-margins; pod 2·5–4 cm long 50. *C. keniensis*
31 Bracts falling before flowers open 32
Bracts persistent 33
32 Keel shallowly rounded, much exceeding wings, 1·2–1·5 cm long; pod very shortly stipitate, cylindrical, sometimes slightly curved 28. *C. pallida*
Keel rounded, with a well differentiated practically straight beak, little longer than wings, (1·5–)1·7–2·3 cm long; pod with a 5–7 mm long stipe, oblong-club-shaped 24. *C. comanestiana*
33 Stipules present, at least at base of young leaves 34
Stipules absent 46
34 Leaflets densely hairy on both surfaces, with 3–5 markedly raised ascending lateral nerves beneath; calyx (5–)6–8 mm long, with narrow lobes 2–3 times as long as tube 45. *C. lotiformis*
Leaflets with more numerous markedly raised nerves; calyx-lobes less than twice as long as tube. 35
35 Keel 10–23 mm long; robust erect well-branched slightly woody herbs mostly 1–4 m tall, with rather uniformly shaped elliptic to obovate leaflets 36
Keel 4–10 mm long; spreading, straggling-ascending or shortly erect, rarely 1 m tall, but if so then leaflets usually variable in shape, longer and proportionally narrower on upper leaves 38
36 Keel much exceeding wings, with a narrow slightly incurved beak; leaves 3–5-foliolate; pod narrowly cylindrical, sometimes curved up at tip; bracteoles longer than calyx-tube 37. *C. cleomifolia*
Keel shorter to a little longer than wings, with a generally straight beak; leaves 3 (exceptionally an odd leaf 4–)-foliolate; pod broadened apically; bracteoles usually shorter than calyx-tube 37
37 Keel (1·5–)1·7–2·3 cm long; pod 3·5–5 cm long; bracteoles linear or subulate 24. *C. comanestiana*
Keel 1–1·2 cm long; pod 2–3 cm long; bracteoles narrowly triangular 25. *C. burttii*
38 Racemes dense (slightly laxer with age in 27. *C. bogdaniana*), the flowers and often the fruits more or less obscuring the axis 39
Racemes lax at least on the lower half 43

39 Plants hirsute with hairs ± 1 mm long; pods densely covered with brown hairs in 2 storeys 40. *C. vasculosa*
Plants more shortly hairy; pods white puberulous to pubescent 40
40 Petals all strongly lined with purple; pod practically sessile, subcylindrical; stipules less than 1 mm long 41
Petals wholly yellow or faintly lined only on standard; pod shortly stipitate, slightly broadened upwards; stipules 2–7 mm long 42
41 Erect or spreading annual, sometimes much branched from the base; calyx coarsely and densely pubescent with irregularly arranged hairs 34. *C. vallicola*
Trailing perennial, many-stemmed; calyx shortly appressed pubescent 35. *C. chrysochlora*
42 Calyx glabrous or with few scattered hairs on lobes, 2–2·5 mm long; erect annual, with ribbed branches and oblong-oblanceolate leaflets 26. *C. pycnostachya*
Calyx pubescent, 2·5–3 mm long; trailing perennial with terete branches and obovate-elliptic leaflets 27. *C. bogdaniana*
43 Bracteoles (at base of calyx) 3–6·5 mm long; calyx becoming basally truncate and deflexed; keel shortly rounded, with a practically straight rather projecting beak exceeding the wings, 8–10 mm long 38. *C. vatkeana*
Bracteoles 0·5–3 mm long; calyx not basally truncate and deflexed; beak more incurved or scarcely exceeding wings 44
44 Pod 8–11 mm long; racemes with ± 6–18 very laxly arranged flowers; stipules 1–1·5(–2) mm long; keel 4–6(–8) mm long 44. *C. massaiensis*
Pod 12–24 mm long; racemes with generally more numerous flowers, more closely arranged on upper part of axis; stipules 3–16 mm long 45
45 Keel 9–10 mm long; pod 20–24 mm long 42. *C. ukambensis*
Keel 7–8 mm long; pod 12–18 mm long 43. *C. uguenensis*
46 Perennial, with numerous slender trailing or shortly ascending stems; keel not or little exceeding the wings; pod 1·5–2·2 cm long 47
Annual or short-lived perennial, with a single erect stem, variously branched and sometimes with numerous spreading branches from near the base 48
47 Leaflets elliptic to obovate; keel very shortly beaked 5–6(–7) mm long 35. *C. chrysochlora*
Leaflets narrowly oblong-elliptic to oblanceolate; keel prominently beaked, (7–)8–9 mm long 36. *C. cylindrica*
48 Keel shallowly rounded, 1·7–2·8 times as long as wide, with a distinctly projecting bluntly pointed beak, 1·2–2·4 cm long 49
Keel more strongly rounded, 1·2–1·6 times as long as wide, with an incurved pointed beak or a very short beak, up to 1·3 cm long 50
49 Pod 15–20 mm across; calyx glabrous; standard cream or pale yellow 29. *C. ochroleuca*
Pod 5–7 mm across; calyx puberulous; standard usually bright yellow 30. *C. brevidens*
50 Racemes dense, many-flowered, the flowers and fruits more or less obscuring the axis; pods rather shortly and fatly cylindrical; wings longer than keel 51
Racemes laxer at least in lower half or few-flowered; pods narrowly cylindrical 52
51 Keel 5–7 mm long, with a very short blunt beak 34. *C. vallicola*
Keel 10–12 mm long, with a narrow incurved beak 39. *C. petitiana*
52 Keel 10–13 mm long; pod 2·8–4 cm long 31. *C. dewildemaniana*
Keel 5–8·5 mm long; pod up to 3·2 cm long (in our area) 53
53 Pod 2·4–3·2 cm long; wings exceeding keel (in our area); plants erect, laxly branched; racemes many-flowered 32. *C. lanceolata*
Pod 1·8–2·2 cm long; wings shorter than keel; plants with numerous, sometimes rather spreading, branches from near the base; racemes few-flowered 33. *C. balbi*
54 Stipules absent; pods subglobose to oblong-ellipsoid, 3–6 mm long, 2–10-seeded; leaflets narrow, mostly broadest in the upper half 55
Stipules present; pods larger; leaflets various 59
55 Flowers, apart from the short terminal racemes, mostly clustered in many of the axils below 67. *C. alexandri*
Flowers almost all in terminal racemes or heads 56
56 Racemes contracted to short dense sessile heads surrounded by longer spreading leaves (bearing leaflets 3–5 cm long) 63. *C. cephalotes*
Racemes not surrounded by a false whorl of long leaves 57
57 Pod 6–8-seeded; standard puberulous only at apex outside; flowers in heads 65. *C. jacksonii*

Pod 1–2-seeded; standard uniformly hairy outside; flowers usually in elongate racemes (unless diseased) 58

58 Calyx and standard golden-brown tomentose; pod 5–6 mm long 64. *C. pseudotenuirama*
Calyx and standard with short white hairs; pod 3–4(–4·5) mm long 66. *C. hyssopifolia*

59 Bracteoles curved up like 2 horns from just below calyx; calyx ± as long as standard; leaflets obovate or suborbicular 11. *C. incana*
Bracteoles not curved up like horns; calyx shorter than standard 60

60 Leaves (except on youngest branches) mostly subtending very short lateral shoots bearing clusters of smaller leaves; keel 1–1·6 cm long with a spirally twisted beak 61
Leaves not in tufts 63

61 Racemes of 2 sorts, in addition to terminal and leaf-opposed racemes the flowers borne 1–4 on slender axes arising from the leaf-tufts; pod 8–10 mm long (in our area) 61. *C. oocarpa*
Racemes all similar, terminal and leaf-opposed; pod 25–30 mm long 62

62 Calyx 5–7 mm long, with triangular lobes not much longer than the tube; keel scarcely angled; seeds smooth 53. *C. fascicularis*
Calyx (6–)7–9 mm long, with narrow lobes mostly 2–3 times as long as tube, becoming reflexed; keel distinctly angular; seeds slightly rough 54. *C. emarginella*

63 Calyx-lobes 2–3 times as long as tube; leaflets densely hairy on both surfaces, with 3–5 markedly raised ascending nerves beneath; spreading perennial 45. *C. lotiformis*
Calyx-lobes not much longer than tube; leaflets with more numerous, less markedly raised ascending nerves 64

64 Beak of keel with a spiral twist (look for diagonal course of upper seam and veins); bracteoles inserted on pedicel; calyx-tube protracted on lower side 65
Beak of keel not twisted; bracteoles at base of calyx; calyx-lobes arising at ± same level 68

65 Shrubby, with slender woody puberulous branches; keel 1·1–1·3 cm long; leaflets elliptic-oblanceolate to obovate, often with a clearly visible vein-network 50. *C. keniensis*
Herbaceous; keel smaller or leaflets varying in shape, longer and proportionally narrower above 66

66 Perennial, with numerous shortly ascending or prostrate stems; petioles mostly less than 1 cm long; flowers often few, rather crowded at top of a relatively long peduncle 59. *C. rhizoclada*
Annual, sometimes much-branched from near the base; petioles often mostly longer; racemes, except in depauperate plants, generally with numerous flowers 67

67 Pod, with a 3–9 mm long stipe, (1·5–)2–4 cm long; calyx often glabrous; plants laxly branched, with generally narrow leaflets at least above 57. *C. deserticola*
Pod, with a 1–2 mm long stipe, 1·4–2·2 cm long; calyx puberulous; plants rather bushy, much branched from base, with rather uniformly shaped oblanceolate to elliptic-obovate leaflets 58. *C. greenwayi*

68 Keel 1·5–2·3 cm long; pod 3·5–5 cm long 24. *C. comanestiana*
Keel up to 1 cm long; pod less than 3 cm long 69

69 Standard pubescent outside; flowers 4·5–7·5 mm long, in short dense racemes or heads on a relatively long peduncle; pods 6–7·5 x 2–4 mm; small spreading annual 46. *C. microcarpa*
Standard glabrous outside; other characters not combined 70

70 Racemes shortly pedunculate, dense; pods broadest towards apex 71
Racemes lax; pods usually broadest about the middle 72

71 Calyx glabrous or with a few scattered hairs on lobes, 2–2·5 mm long; erect annual, with ribbed branches and oblong-oblanceolate leaflets 26. *C. pycnostachya*
Calyx pubescent, 2·5–3 mm long; trailing perennial, with terete branches and obovate-elliptic leaflets 27. *C. bogdaniana*

72 Pod 23–27 mm long; keel 8–10 mm long, with a projecting beak exceeding the wings; bracteoles 3–6·5 mm long 38. *C. vatkeana*
Pod 8–11 mm long; keel 4–6 mm long, scarcely exceeding wings; bracteoles 0·5–1·5 mm long 44. *C. massaiensis*

73 Keel rounded about the middle, shortly beaked 74
Keel angled in the lower half, with a well-developed straight narrow beak 76

74 Keel 13–14 mm long; pod 45–50 mm long; bracts cordate 56. *C. spectabilis*
Keel 6–8 mm long; pod 6–32 mm long; bracts narrow 75

75 Leaves subsessile, simple, narrow, glabrous or practically so; pod stipitate, cylindrical, glabrous, 24–30-seeded 20. *C. glauca*

Leaves with 4–15 mm long petioles; leaflets ovate to oblong-lanceolate, thinly pilose; pod sessile, subglobose, hairy, 1–6-seeded
41. *C. anthyllopsis*

76 Keel 9–11 mm long; pod 2·7–3·5 cm long
60. *C. karagwensis*

Keel 4–6 mm long; pod 1–1·5 cm long 77

77 Leaves with 3–4 mm long petioles, 1-foliolate, pilose beneath; stipules absent
47. *C. bongensis*

Leaves with a petiole less than 1 mm long, simple, thinly puberulous beneath; stipules present 48. *C. shirensis*

1. Crotalaria agatiflora *Schweinf.*

Woody bushy herb, shrub or small tree, with very large lemon- or greenish-yellow flowers. See KTS. p. 358, also as *C. imperialis* Taub., p. 359.

Three races–one a large shrub or small tree, often tomentose, with elliptic-lanceolate leaflets and large caducous bracts, in or near forests, (6500–)7000–10 500 ft, in HE, HT, HM, HL, HA, HK, RV (subsp. *engleri* (Bak. f.) Polhill); another tending to be smaller, hairy, with elliptic-ovate leaflets and much smaller bracts in grassland and bushland, 6000–7000 ft, in HT, ?HM, HL, KIT, KIS, NAR, NAN, (subsp. *imperialis* Taub.) Polhill); the last and typical subsp. *agatiflora* a woody herb, glabrous except sometimes on the leaflets beneath but otherwise as subsp. *imperialis* and occurring in open places, 5000–8000 ft, in HM, HA, RV, MAC, NBI. Intermediates wherever populations of the different races meet.

2. Crotalaria lebrunii *Bak. f.*

Shrub with pointed elliptic leaflets, the flowers like *C. laburnifolia* except for the united upper and lateral calyx-lobes; pods with shorter stipe and much more inflated than in *C. laburnifolia.*

Forest edges, 7000–7700 ft. HA, HK, HN.

Bogdan 2826; Verdcourt and Polhill 2996.

3. Crotalaria laburnifolia *L.*

Robust scarcely woody erect herb, with lax racemes of 2–3 cm long yellow flowers often speckled reddish-brown, free calyx-lobes and slenderly long-stipitate pods. See KTS. p. 359.

Two main races–subsp. *laburnifolia* in bushland and wooded grassland, 3000–5600 ft, almost everywhere, MUM, KIS, NAR, BAR, RV, MAG, EMB, MAC, NBI, KAJ, and subsp. *eldomae* (Bak. f.) Polhill with diffuse habit, short petioles 1–2·5 cm long, small leaflets and few-flowered racemes, in drier places and often on volcanic soils in RV, MAG, KAJ, also a form of subsp. *laburnifolia* approaching subsp. *eldomae* ('Elgon race'), 5000–7400 ft in KIT and MUM.

4. Crotalaria pseudospartium *Bak. f.*

Very similar to *C. laburnifolia* but with very reduced leaflets less than 1 cm long on long petioles, and with the upper and lateral calyx-lobes united. See KTS. p. 359. RV.

5. Crotalaria goodiiformis *Vatke*

Slender-stemmed much-branched shrub, with membranous elliptic to obovate leaflets, the 1–1·2 cm long yellow flowers few on a thread-like rachis, developing thin-valved oblong-club-shaped pods. See KTS. p. 359, under *C. saxatilis* Vatke. HA, EMB, MAC, NBI, KAJ.

6. Crotalaria mauensis *Bak. f.*

Robust bushy herb or shrub, brown tomentellous, with elliptic leaflets and long subdense racemes, the broadly lobed calyx the same length as the chubby yellow corolla, 1·2–1·5 cm long. See KTS. p. 359. HT, HM, HA, HK, MUM, ?BAR, MAC, NBI.

7. Crotalaria quartiniana *A. Rich.*

Laxly branched annual, with spreading hairs and pointed elliptic leaflets, flowering shyly; flowers with ovate-cordate calyx-lobes enveloping the pale yellow wine-marked petals (wings brighter) and further adorned by large ovate bracteoles; standard glabrous; pods thin-valved, oblong-club-shaped, glabrous.

Rare plant found on forest edges or grass and bush nearby, 6700–7900 ft. HE, KIT.

Irwin 133, 133A; Tweedie 1711.

8. Crotalaria polysperma *Kotschy* (see p. 297)

Erect well-branched hairy annual, with elliptic leaflets and 12–20-flowered racemes of large blue flowers, the pilose calyx nearly the same length as the angular keel, 1·6–1·8 cm long; pod broadly oblong-club-shaped, (3·5–)4–4·5 cm long, pilose, *c.* 70–100-seeded.

Deciduous bushland and grassland, 3000–6200 ft. NAR, RV, MAG, MAC, KAJ.

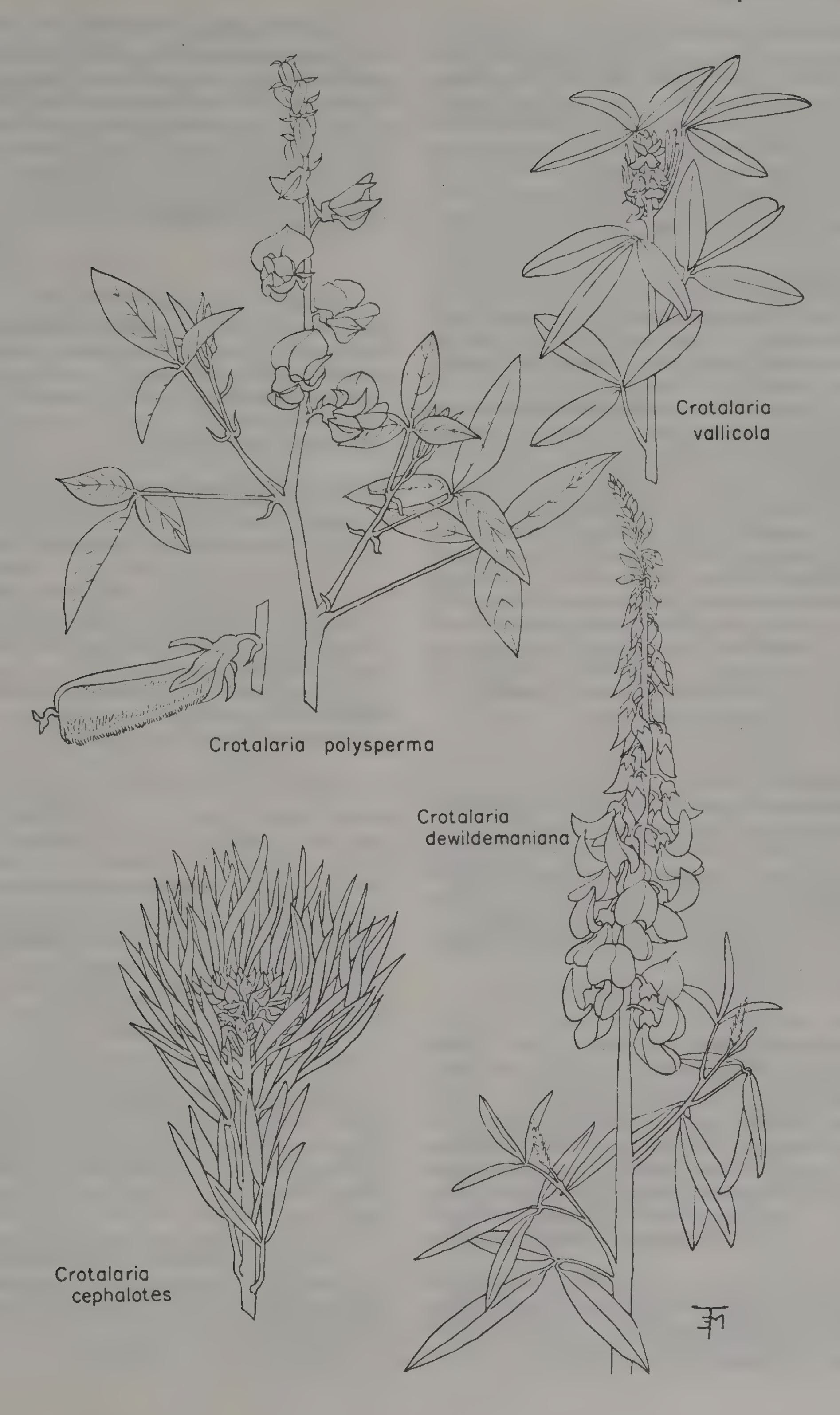
Bally 10548; Greenway 9199.

9. Crotalaria serengetiana *Polhill*

As *C. polysperma*, but smaller, spreading, generally with narrowly elliptic-lanceolate leaflets, and smaller flowers, blue only when fully open; keel 1·1–1·4 cm long; pod 2·5–2·8 cm long, densely pilose, only *c.* 20–24-seeded.

Grassland, 5000 ft. KAJ.

Lind 3091.


Crotalaria vallicola
Crotalaria polysperma
Crotalaria dewildemaniana
Crotalaria cephalotes

10. Crotalaria barkae *Schweinf.*

Spreading hairy annual (rarely perennial), with lanceolate to elliptic leaflets and few white, cream or greenish-yellow flowers; keel angled, scarcely exceeding the broadly lobed calyx, 1·2–1·6 cm long; pod ellipsoid-club-shaped, 2–3·5 cm long, sparsely pilose or glabrous up to 44-seeded.

Grassland, 3000–4500 ft. KAJ, MAC.

Napper 1724; Verdcourt 3970; Agnew 8464.

11. Crotalaria incana *L.*

Erect, well branched, generally annual, with obovate leaflets (drying blackish) and generally long racemes of rather miserable yellow reddish-marked flowers; calyx nearly as long as the 8–12 mm long angular keel, with the linear bracteoles rising like horns from the base; pods somewhat canoe-shaped, 3–4·5 cm long.

Two races—subsp. *incana*, with shortly pubescent branches, 1–3 mm long bracts and subglabrous calyx-lobes only in deciduous bushland and dry grassland of RV and MAC, the subsp. *purpurascens* (Lam.) Milne-Redh., with long spreading yellow-brown (rarely white) hairs, 4–10 mm long bracts and pilose calyx-lobes, much more catholic, extending into upland grassland and bushland, becoming a weed, 4000–7500 ft. HE, HM, HA, HK, KIT, NAR, RV, MAC, NBI, KAJ.

Bogdan 3215; Williams 225.

12. Crotalaria stolzii (*Bak. f.*) *Polhill*

Straggling-erect rather stiffly branched subglabrous semi-woody herb, immediately recognizable by the very large equal-sided reticulate-veined heart-shaped stipules; leaflets oblanceolate; flowers bright yellow, 1·1–1·3 cm long; pods oblong, somewhat flattened laterally, 1·6–1·8 cm long.

Very rare plant found on stream banks, 8000–10 000 ft. HC, HT, HK.

Bogdan 3858; Thulin and Tidigs 163.

13. Crotalaria natalitia *Meissn.* (see p. 292)

Woody herb or shrub 1–2 m tall, with stiffly ascending densely pubescent branches; leaves clustered, with obliquely lanceolate stipules and oblanceolate to oblanceolate-elliptic leaflets; flowers bright yellow, marked reddish with age, with an ovate-orbicular standard and a somewhat angled 1–1·5 cm long keel woolly along the upper edge; pod broadly cylindrical, stipitate, glabrous, often mottled.

Forest edges, bushland, wooded or open grasland, 5500–10 000 ft. HE, HC, HT, HM, HA, HK, KIT, BAR, RV, MAC, NBI, KAJ.

Lucas 211; Napper 637.

14. Crotalaria cylindrocarpa *DC.*

Erect pubescent perennial, with obliquely lanceolate to somewhat crescent-shaped stipules, variably shaped but often oblanceolate to elliptic-obovate leaflets and subdense racemes of reddish-marked yellow flowers; standard ovate; keel subangular, 1–1·5 cm long, woolly along upper edge; pod cylindrical, 2·3–3 cm long, puberulous.

Wooded grassland. MUM.

A. Whyte s.n.

15. Crotalaria goreensis *Guill. & Perr.*

Erect much-branched annual, very similar to *C. cylindrocarpa*, but keel less than 1 cm long and pods only 1·5–2 cm long.

Wooded grassland, only recorded by Lake Victoria. MUM/KIS.

Tweedie 2835, 2898.

16. Crotalaria podocarpa *DC.*

Spreading hirsute annual, with somewhat curved obliquely oblong-lanceolate stipules, mostly rather narrow leaflets and racemes of few bright yellow flowers; keel angular, 1·2–1·7 cm long, woolly along upper edge; pod fatly cylindrical on a distinct slender stipe, glabrous, pale with darker suture; seeds large, rough, orange.

Wooded grassland, in dry, open, sandy places, 4000–4700 ft. BAR.

Bogdan 5173; Tweedie 2272.

17. Crotalaria lachnophora *A. Rich.* (see p. 292)

Robust woody herb 1–3 m tall, with ascending tomentose branches, broad somewhat crescent-shaped stipules, oblanceolate to elliptic-obovate leaflets and handsome yellow flowers fading orange; keel abruptly rounded with a straight beak, 1·8–2·5 cm long, woolly along upper edge; pod cylindrical, furry.

Open or wooded grassland, bushland, 4500–6700 ft. KIT, KIS, EMB, MAC.

Bogdan 5479; Napper 1629.

18. Crotalaria lachnocarpoides *Engl.* (see p. 292)

Woody bushy tomentose herb, up to 0·5–2·5 m tall, with linear stipules, short petioles, felty oblong-oblanceolate leaflets and racemes of few yellow flowers which fade reddish; keel shorter than calyx, almost semicircular, shortly beaked, 1·1–1·8 cm long, with a thin band of hairs towards lower margin; pod broadly cylindrical, furry.

Grassland and bushland, 4500–9000 ft. HE, HC, HT, HM, HA, HK, KIT, MUM, NAR, BAR, RV, MAC, KAJ.

Greenway 8531; Napper 1623.

19. Crotalaria orthoclada *Bak.* (see p. 292)

Shrubby perennial 1–3 m tall, with many stiffly ascending densely pubescent leafy branches, short petioles, no stipules, rather small oblanceolate leaflets, and lax terminal racemes of few yellow flowers; keel shorter than calyx, strongly rounded, with a twisted beak, 7–9 mm long; pod narrowly cylindrical, with fine spreading hairs.

Wooded grassland and bushland at about 6000 ft, rare. KIT.

Irwin 180; Tweedie 2856.

20. Crotalaria glauca *Willd.*

Slender erect annual, glabrous, glaucous, with narrow subsessile simple leaves and lax few-flowered racemes, the standard pale, the wings brighter yellow; keel as long as calyx, almost semicircular, with a very short circumflexed beak, 6–8 mm long; pod narrowly cylindrical, stipitate.

Locally common in grassland 4500–7600 ft. HE, HT, HM, KIT, MUM, RV, EMB, NBI, KAJ.

Brodhurst-Hill 336; Williams 163.

21. Crotalaria ononoides *Benth.*

Spreading pilose annual, with short petioles, lanceolate, elliptic or obovate leaflets and dense sessile heads of yellow reddish-marked 7–9 mm long flowers, appearing whiskery on account of the long narrow calyx-lobes, the bracteoles and also the 3-fid bracts spreading from just below the calyx; pod ellipsoid, glabrous except at apex.

Only once recorded from dry places in Kavirondo. MUM.

Scott Elliot 7119.

22. Crotalaria verdcourtii *Polhill*

Bushy herb, with tomentellous branches, long-petiolate stipulate leaves, elliptic to obovate leaflets and long racemes; standard broad, bright yellow, usually with a wine-coloured basal zone, turning reddish over-all; keel much shorter than the broad wings and little exceeding the subsequently reflexed calyx-lobes, rounded, with a rather short ultimately twisted beak, 1·1–1·4 cm long; pod oblong-club-shaped, tomentellous, with 24–36 rough seeds.

Wooded grassland, about 5000–5600 ft. NAN, EMB, MAC, KAJ.

Greenway 9540; Verdcourt 2175.

23. Crotalaria deflersii *Schweinf.*

Very similar to *C. verdcourtii*, although often less hairy and with smaller stipules, but the keel very short, 6–8 mm long, and the pod only 16–20-seeded.

Deciduous bushland, often in rocky places, 4000–5000 ft. RV, MAG.

Bogdan 3474; Greenway 9518.

24. Crotalaria comanestiana *Volkens & Schweinf.*

Woody herb, erect to 1·3 m, with tomentellous branches, long petioles and elliptic to obovate leaflets; flowers numerous, bright yellow, turning reddish-brown; keel very much longer than calyx and slightly exceeding the wings, rounded with a long projecting beak, (1·5–)1·7–2·3 cm long; pod oblong-club-shaped, 3·5–5 cm long, pubescent.

Stony ground and lava ridges in deciduous bushland, 3000 ft. MAG.

Bally 8017; Glover and Samuel 2806.

25. Crotalaria burttii *Bak. f.*

Bushy herb, with tomentellous branches, elliptic or obovate leaflets and numerous yellow flowers which fade reddish; calyx much shorter than corolla, with narrowly triangular bracteoles at base; keel slightly shorter than the wings, rounded, with projecting beak, 1–1·2 cm long; pod oblong-club-shaped, 2–3 cm long, densely pubescent.

Clay soils of seasonally inundated depressions in deciduous bushland. MAG.

Verdcourt 3270; Verdcourt *et al.* 2661.

26. Crotalaria pycnostachya *Benth.*

Erect and spreading annual, with ribbed puberulous branches, conspicuous thread-like stipules, oblong-oblanceolate leaflets and dense racemes of small yellow flowers; calyx short, practically glabrous; keel shortly beaked, 4–5 mm long; pod oblong-club-shaped, 1·2–1·5 cm long, puberulous.

Open or wooded grassland and deciduous bushland, generally an opportunist of low rainfall areas, 3800–5600 ft. KIS, BAR, MAC, NBI, KAJ.

Bally 9719; Polhill and Paulo 1018.

27. Crotalaria bogdaniana *Polhill*

Trailing perennial, with shortly petiolate stipulate leaves, obovate-elliptic leaflets and subdense racemes of small pale yellow, sometimes faintly maroon-veined, flowers; calyx short, pubescent; keel scarcely as long as wings, shortly rounded, with a projecting beak, 6–9 mm long; pod oblong-club-shaped, 1·6–2 cm long, pubescent.

Grassland on black clay soils, 3700–5700 ft. EMB, MAC, NBI, KAJ.

Bogdan 3999; Verdcourt 3854.

28. Crotalaria pallida *Ait.*

Erect well-branched puberulous annual or short-lived perennial, 1–2 m tall, with elliptic or obovate leaflets and subdense racemes of many yellow,

generally reddish-brown-veined, flowers; bracts caducous; keel shallowly rounded, with a projecting beak much exceeding the calyx and wings, 1·2–1·5 cm long; pod shortly stipitate, rather narrowly cylindrical, often slightly curved, 3·8–4·5 cm long.

Two variants—var. *pallida* with mostly 6–13 cm long elliptic pointed leaflets and var. *obovata* (G. Don) Polhill with smaller obovate leaflets. Bushland near rivers and lakes, 3700–5000 ft. KIT, MUM, KIS, BAR.

Bogdan 2908; Tweedie 2097.

29. Crotalaria ochroleuca *G. Don*

Erect, generally annual, with narrow leaflets and lax racemes of large pale yellow reddish-veined flowers; calyx basally truncate, shortly toothed, glabrous; keel shortly rounded, with a long projecting beak, 1·8–2·2 cm long, conspicuously veined; pods subsessile, broadly cylindrical, 5–7 cm long, 1·5–2 cm across, up to 100-seeded.

Damp riverside grassland, 6000 ft. MUM.

Brodhurst-Hill 385.

30. Crotalaria brevidens *Benth.* (see p. 304)

Erect to spreading annual or short-lived perennial, with variably shaped but mostly narrow leaflets and sublax racemes of yellow, reddish-brown-veined flowers; calyx basally truncate, pubescent; keel shallow, shortly rounded, with a projecting beak, 1·2–2·4 cm long, conspicuously lined; pods subsessile, narrowly cylindrical, often a little curved at ends, (3·5–)4–4·5 cm long, up to 80-seeded.

The common large-flowered form is var. *intermedia* (Kotschy) Polhill, but a smaller flowered var. *parviflora* (Bak. f.) Polhill, with keel only 1·2–1·4 cm long, occurs around Nairobi, east to EMB, also on high ground north to Laikipia and the Mau, and is very similar to the following species except in keel-shape. Grassland and bushland of various types, 4500–9000 ft. HE, HC, HT, HM, HA, HK, KIT, MUM, KIS, NAR, RV, NAN, EMB, MAC, NBI.

Napier 108; Verdcourt 1804.

31. Crotalaria dewildemaniana *Wilczek* (see p. 297)

Very similar to *C. brevidens* var. *parviflora*, but the 1–1·3 cm long keel strongly rounded with a slightly incurved beak and the pods generally smaller; also similar to *C. lanceolata*, but the flowers larger.

Only the subsp. *oxyrhyncha* Polhill, in grassland, (3000–)5000–7200 ft. HE, HT, HM, KIT, RV, MAC, NBI, KAJ.

Leakey in CM 8553; Tweedie 922A.

32. Crotalaria lanceolata *E. Mey.*

Erect laxly branched annual, with mostly narrow leaflets and long racemes of rather small yellow, reddish-purple-veined flowers; calyx basally truncate, shortly lobed, pubescent; keel rounded about the middle, with a slightly incurved conspicuously lined beak shorter than the wings, 8–9 mm long; pod narrowly cylindrical, often curved up at tip, 2·4–3·2 cm long, ± 24–50-seeded.

Only the subsp. *contigua* Polhill, which closely approaches *C. dewildemaniana* subsp. *oxyrhyncha* and may introgress in KIT. Grassland and forest margins, 5900–7100 ft. HM, KIT, KIS, KAJ.

Kerfoot 3886; van Someren 189.

33. Crotalaria balbi *Chiov.*

Erect to spreading puberulous annual or short-lived perennial, with mostly rather narrow leaflets and long-pedunculate racemes, the often rather few small yellow, reddish- or purplish-veined flowers crowded above; calyx basally truncate; keel rounded about the middle, with a slightly incurved sharp beak exceeding the wings, 5–7 mm long; pod narrowly cylindrical, 1·8–2·2 cm long.

Grassland, 5700–7000 ft. HA, MAC, ?NBI.

Bogdan 3364; Mwangangi 62.

34. Crotalaria vallicola *Bak. f.* (see p. 297)

Erect annual, with many rather spreading densely pubescent branches, minute stipules, oblong-lanceolate to elliptic leaflets and dense shortly pedunculate racemes of small yellow purple-veined flowers; calyx basally truncate; standard obovate; keel rounded, only slightly beaked, shorter than the wings, 5–7 mm long; pod subcylindrical, 1·7–2·2 cm long.

Grassland and bushland, often in rocky or disturbed places, 3800–7500 ft. HE, HC, HT, KIT, MUM, KIS, NAR, RV, MAC.

Bogdan 1826; Verdcourt 4038.

35. Crotalaria chrysochlora *Harms* (see p. 301)

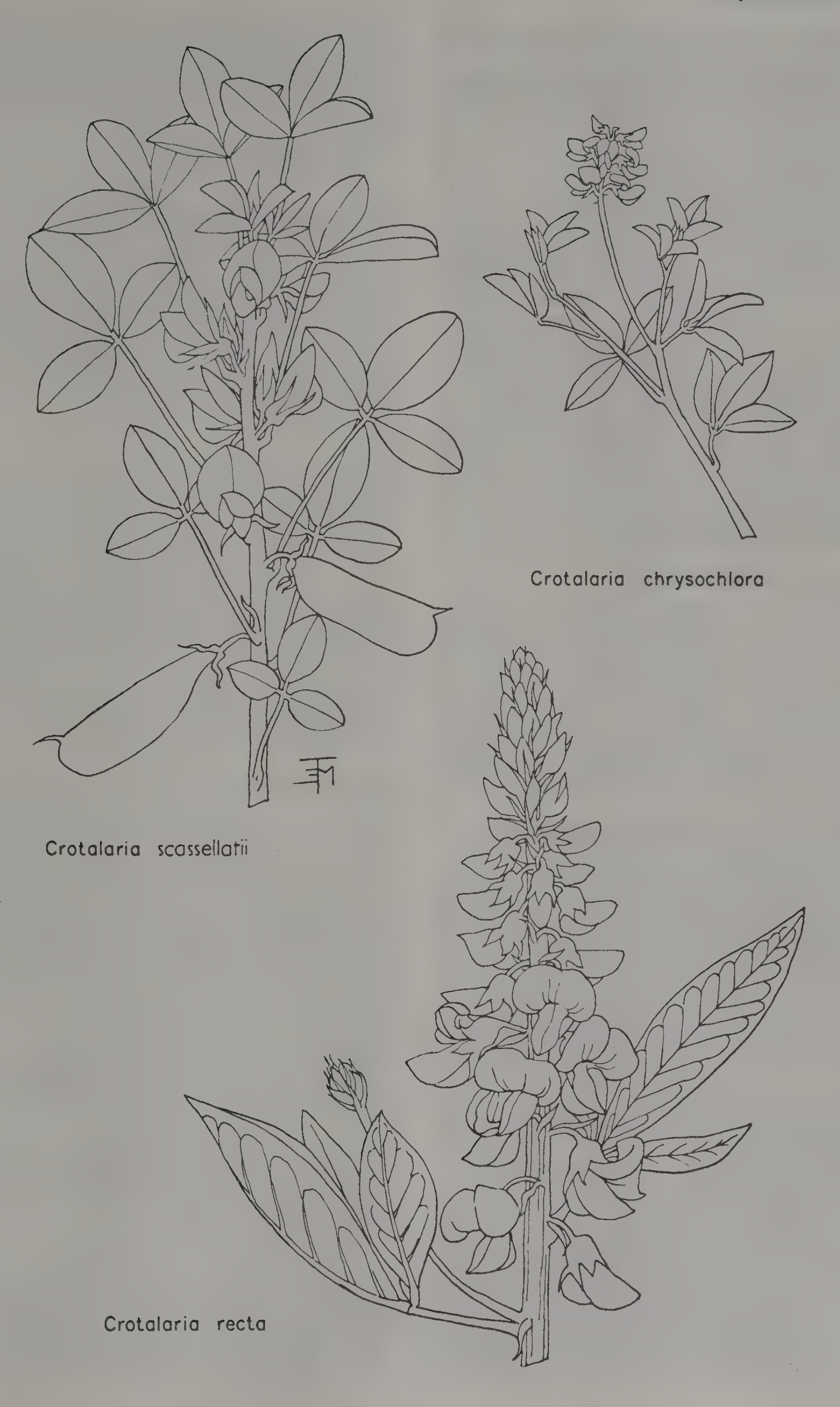
Perennial, with numerous slender creeping or shortly ascending pubescent stems, small elliptic to obovate leaflets and subdense racemes of few yellow purplish-veined flowers similar to those of *C. vallicola*; pod 1·5–1·8 cm long.

Grassland, often in rocky or disturbed places, 5000–8700 ft. HC, HT, HM, HA, HK, KIT, MUM, NAR, KAJ.

Polhill 2414; Williams 235.

36. Crotalaria cylindrica *A. Rich.* (see p. 292)

Similar to *C. chrysochlora*, but with narrower leaflets and rather larger flowers; keel rounded, with a short projecting beak, not or scarcely



Crotalaria chrysochlora

Crotalaria scassellatii

Crotalaria recta

exceeding the wings, 8–9 mm long; pod narrowly cylindrical, 1·6–2·2 cm long.

Only the subsp. *afrorientalis* Polhill, in montane grassland and moor, 6000–10 600 ft. HE, HC, HT, HM, HK.

Rogers 392; Tweedie 1418.

37. Crotalaria cleomifolia *Bak.*

Shrubby perennial 1–4·5 m tall, with 3–5-foliolate leaves, elliptic leaflets and long racemes of bright yellow faintly reddish-lined flowers; calyx with long bracteoles from the truncate base; standard elliptic; keel rounded, with a narrow slightly incurved beak, much longer than the wings, 1·4–1·7 cm long; pod narrowly cylindrical, 4–5 cm long.

Striking species, generally recognizable by the predominantly 5-foliolate leaves, but with very diversely developed indumentum. Locally common by streams and swamps or in grassland and bushland near forests, 5000–7800 ft. HE, HM, HA, HN, KIT, MUM, MAC.

Bogdan 5478; Polhill and Verdcourt 261.

38. Crotalaria vatkeana *Engl.*

Straggling thinly pubescent annual, with variably shaped leaflets and long-pedunculate ultimately sublax racemes of yellow purplish-veined flowers; calyx with relatively long bracteoles from the truncate base; keel shallow, shortly rounded, with a projecting beak exceeding the wings, 8–10 mm long; pod narrowly cylindrical, 2·3–2·7 cm long.

Openings in forest or grassland and bushland nearby, 6000–10 000 ft. HE, HT, HM, HA, HN, KIT, NBI, KAJ.

Bogdan 924; Verdcourt and Polhill 2961.

39. Crotalaria petitiana (*A. Rich.*) *Walp.*

Erect rather bushy annual 0·5–2 m tall, with tomentellous ribbed branches, no stipules, oblong-lanceolate to elliptic leaflets, and long dense racemes of yellow reddish- or purplish-veined flowers; calyx with relatively long bracteoles from the truncate base; keel strongly rounded, with a narrow slightly incurved beak, shorter than the wings, 1–1·2 cm long; pod shortly cylindrical, 1·5–2·5 cm long.

Grassland and bushland, 3900–6200 ft. KIT, MUM, KIS, NAR, EMB.

Irwin 191, 193, 196.

40. Crotalaria vasculosa *Benth.*

Spreading hirsute annual, with very short petioles, lanceolate to elliptic-obovate leaflets and dense racemes of pale yellow purplish-veined flowers; calyx subglabrous, with relatively long bracteoles from the truncate base; keel shortly rounded, with a narrow slightly projecting sharp beak slightly exceeding the wings, 6·5–8·5 mm long; pod shortly cylindrical, 1·6–2 cm long, very densely covered with short and very long brown hairs.

Wooded grassland, in old cultivations, 4700 ft. MUM.

Tweedie 3394.

41. Crotalaria anthyllopsis *Bak.*

Spreading hirsute annual, with stipulate 1-foliolate leaves; leaflets oblong-lanceolate to ovate; flowers in dense subsessile racemes, pale yellow with purplish veins, subtended by long bracts and bracteoles; keel strongly rounded, 5–7 mm long; pod subglobose, densely hirsute, 2–6-seeded.

Wooded grassland, sometimes in rocky places, 6000–6700 ft. KIT, MUM, ?BAR.

Brodhurst-Hill 48; Tweedie 1327.

42. Crotalaria ukambensis *Vatke*

Straggling conspicuously pilose short-lived perennial, with well-developed stipules, variably shaped leaflets and long racemes of cream to yellow flowers lined or flushed reddish-purple; bracts 3·5–7 mm long; keel strongly rounded, with a narrow incurved beak exceeding the wings, 9–10 mm long; pod subcylindrical, 2–2·4 cm long, pilose.

Deciduous bushland and wooded grassland, 3000–3500 ft. MAC, KAJ.

Bogdan 3367; Verdcourt 2085.

43. Crotalaria uguenensis *Taub.*

Similar to *C. ukambensis*, but less robust, with shorter hairs and bracts, smaller flowers (keel 7–8 mm long, not much exceeding the wings) and pubescent pods only 1·2–1·8 cm long.

Deciduous bushland, often around rock outcrops, or on clay soils with *Acacia* wooded grassland, 3000–6000 ft. RV, MAG, NAN, MAC, KAJ.

Bogdan 5206; Glover and Samuel 2826.

44. Crotalaria massaiensis *Taub.*

Spreading perennial, with slender pubescent branches, minute stipules, mostly rather small or narrow leaflets, and lax racemes of small cream to yellow purplish-veined flowers; keel strongly rounded, ± as long as the wings, 4–6 mm long; pod shortly cylindrical, 8–11 mm long, pubescent.

Deciduous bushland, 3000–3500 ft. ?BAR, MAG, NAN.

Gillett 16745; Tweedie 1847.

45. Crotalaria lotiformis *Milne-Redh.*

Spreading hairy perennial, with stipules ± as long as the short petioles; leaflets oblanceolate to obovate, apiculate, with few prominent ascending

nerves; flowers few on a relatively long peduncle, yellow, veined reddish-purple; keel rather abruptly rounded, with a straight dark-tipped beak scarcely exceeding the wings, 1–1·3 cm long; pod subcylindrical, 1·8–2·4 cm long.

Open and wooded grassland, sometimes in rocky places or on clay soils, 5500–7000 ft. HA (Ngong Hills), NBI, KAJ.

Milne-Redhead and Taylor 11413; Napier in CM 6304.

46. Crotalaria microcarpa *Benth.*

Much-branched spreading pubescent annual, with small stipules, narrow leaflets and clusters of small flowers on relatively long peduncles; standard yellow, marked red, pubescent outside; keel angled, with a narrow beak little exceeding the wings, 4·5–7·5 mm long; pod ± oblong, 6–7·5 mm long.

Wooded grassland and deciduous bushland, often in disturbed places, 3500–5000 ft. BAR, MAC, KAJ.

Bogdan 3418; Verdcourt 4041.

47. Crotalaria bongensis *Bak. f.*

Small erect annual, with many slender spreading coarsely hairy branches, shortly petiolate narrow 1-foliolate leaves, no stipules, and lax racemes of small yellow, maroon-veined flowers; keel angled, with a narrow untwisted beak slightly exceeding the wings, 4–5 mm long; pod ± oblong, 7–10 mm long.

Collected only once in our area near Kisumu. MUM/KIS.

Tweedie 3463.

48. Crotalaria shirensis *(Bak. f.) Milne-Redh.*

Small erect annual, with thread-like sparsely hairy branches, mostly narrow subsessile simple leaves and lax 1–3-flowered racemes; standard pale yellow, marked red; keel angled, with a forward-curved beak exceeding the bright yellow wings, 5–6 mm long; pod narrowly cylindrical, 1–1·3 cm long.

Wooded grassland, in open sandy or damp places, inconspicuous. KIT.

Heriz-Smith and Paulo 900.

49. Crotalaria tabularis *Bak. f.*

Shrub, pubescent, with filiform stipules, elliptic leaflets and rather lax racemes of yellow flowers; keel rounded, with a rather short twisted beak about as long as the wings, 1·5–1·8 cm long; pod oblong-club-shaped, 5–6·5 cm long.

Forest margins and stream banks, 6500–9000 ft. HA, HN.

Napier 2825; Polhill and Verdcourt 294.

50. Crotalaria keniensis *Bak. f.* (see p. 304)

Straggling shrubby pubescent bush, with minute stipules, relatively small elliptic-oblanceolate to obovate leaflets and racemes of bright yellow flowers; keel rather abruptly rounded, with a twisted beak little exceeding the wings, 1·1–1·3 cm long; pod oblong-club-shaped, 2·5–4 cm long, venose.

Forest edges or bushland and streamsides nearby, 6400–9000 ft. HE, HT, HM, HA, HK, KIS, KIJ.

Bogdan 4151; Verdcourt 666.

51. Crotalaria axillaris *Ait.*

Shrub or woody herb, coarsely hairy (in our area), with elliptic leaflets and clusters of yellow flowers in the axils; keel rounded, with a twisted beak ± as long as the wings, 1·5–1·8 cm long; pod oblong-club-shaped, 4·5 cm long, 0·6–1·2 cm across.

Dry evergreen forest and derived communities, persisting in disturbed places, 4400–7500 ft. HT, HA, HK, RV, EMB, MAC, NBI, KAJ.

Bogdan 2422; Verdcourt 2067.

52. Crotalaria scassellatii *Chiov.* (see p. 301)

Similar to *C. axillaris*, but with a silvery tomentum on branches and underside of leaflets and much fatter pods.

Edges of dry forest and in bushland, often in rocky sites, 3000–5000 ft. MUM/KIS, MAC, KAJ.

Tweedie 1550; Verdcourt 3806.

53. Crotalaria fascicularis *Polhill*

Shrubby, coarsely hairy, with stipulate leaves in tufts, oblanceolate to obovate leaflets and subdense racemes of yellow flowers, calyx with short triangular lobes; keel rounded, with a twisted beak, as long as the wings, 1·2–1·6 cm long; pod narrowly subcylindrical, 2·5–3 cm long, puberulous.

Dry evergreen forest, 6700–7000 ft. HA.

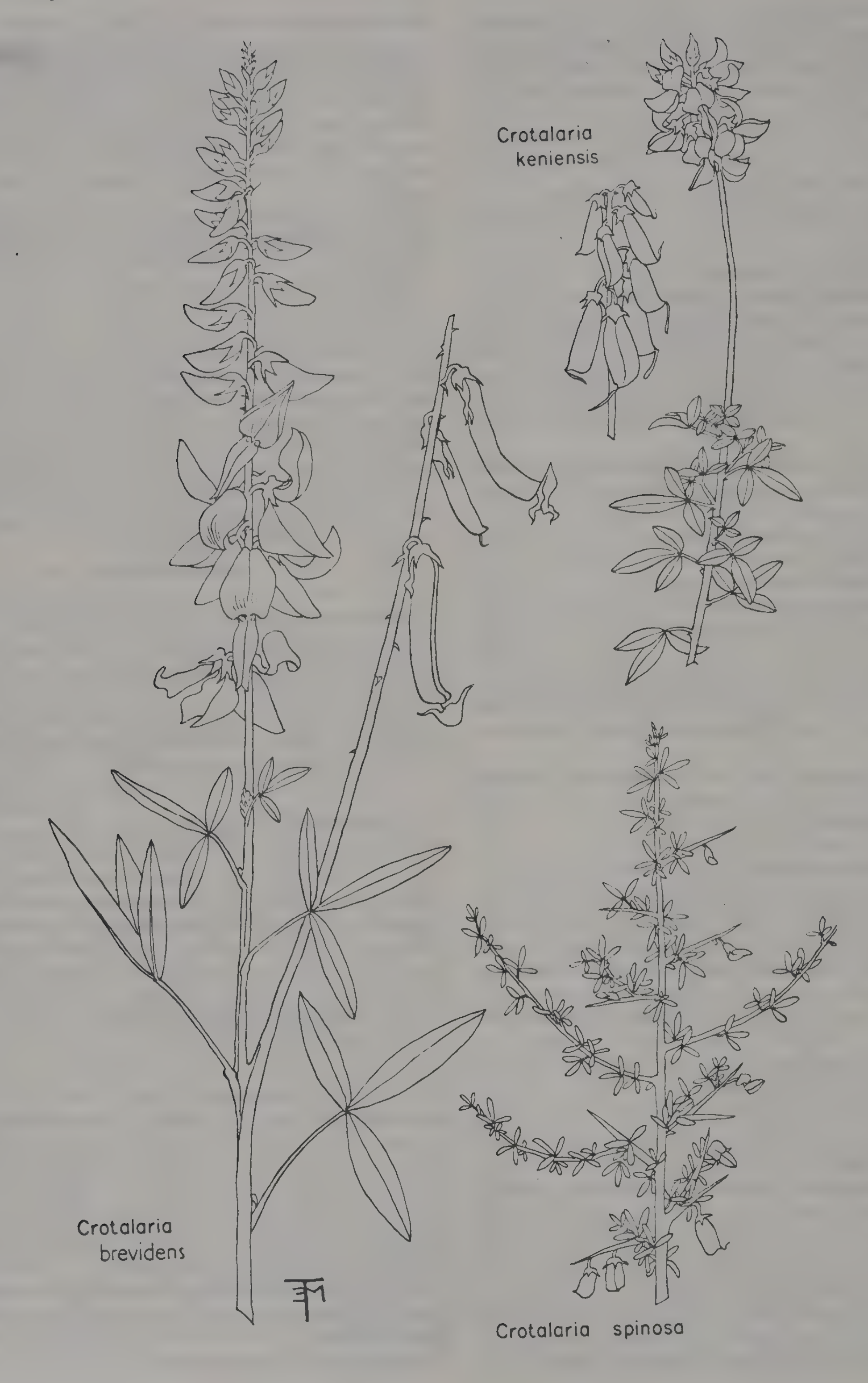
Dowson 622; Polhill 20.

54. Crotalaria emarginella *Vatke*

Spreading woody herb, with variably developed indumentum, stipulate leaves in tufts, rather small obovate leaflets and lax racemes of yellow flowers; calyx with long narrow ultimately reflexed lobes; keel subangular, with a narrow twisted beak, slightly exceeding the wings, 1·1–1·4 cm long; pod narrowly cylindrical, 2–2·8 cm long.

Generally in semidesert grassland and deciduous bushland, rarely in less arid situations, 4500–5700 ft. NAN, EMB.

Bogdan 2713; Napier 2444.


Crotalaria
keniensis
Crotalaria
brevidens
Crotalaria spinosa

55. Crotalaria recta *A. Rich.* (see p. 301)

Robust erect perennial 1–2·7 m tall, with ribbed densely appressed pubescent stems, short stout petioles, linear-lanceolate stipules, generally elliptic to obovate leaflets and long subdense racemes of yellow flowers marked reddish-purple at base of broad standard and wings; calyx glabrous; keel rounded, with a short twisted beak enveloped by the wings, 1·2–1·5 cm long; pod broadly oblong-club-shaped, 5–6 cm long, glabrous.

Grassland or, at lower altitudes, swamp margins, also persisting on cultivated ground, 3000–8400 ft. HE, HT, HM, HA, KIT, MUM, EMB, MAC, KAJ.

Paulo 545; Tweedie 1317.

56. Crotalaria spectabilis *Roth*

Erect annual to 2 m tall, with angular grooved stems, oblong-ovate stipules, shortly petiolate simple oblong-obovate leaves and long lax racemes of yellow flowers; bracts cordate; calyx glabrous; keel rounded, with a short twisted beak enveloped by the broad wings, 1·3–1·4 cm long; pod broadly oblong-club-shaped, 4·5–5 cm long, glabrous.

Introduced species, locally naturalized in wooded grassland on formerly cultivated land, 3900 ft. KIT/MUM.

Tweedie 2891.

57. Crotalaria deserticola *Bak. f.*

Erect or spreading laxly branched inconspicuously hairy annual, with small stipules, generally narrow leaflets and lax racemes of yellow flowers, finely veined reddish-brown on the standard; calyx often glabrous; keel angled, with a narrow twisted beak, 6–18 mm long; pod oblong-club-shaped, (1·5–)2–4 cm long including a 3–9 mm long stipe, puberulous; seeds generally smooth.

Extremely variable, particularly in habit and flower-size; a markedly depauperate form occurs on dry volcanic soils of RV; open and wooded grassland, 3600–8000 ft. HM, HA, HK, KIT, MUM, KIS, NAR, RV, MAC, KAJ.

Bogdan 1857; Napper 1655.

58. Crotalaria greenwayi *Bak. f.*

Similar to *C. deserticola*, but more bushy, with conspicuous short indumentum (always present on calyx), broadly oblanceolate to elliptic-obovate leaflets, constantly small flowers (keel 7–10 mm long) and small legumes, 1·4–2·2 cm long including a 1–2 mm long stipe; seeds rugulose.

Deciduous bushland and semidesert grassland. MAG.

Greenway 8993; Verdcourt 589.

59. Crotalaria rhizoclada *Polhill*

Prostrate or shortly ascending perennial, sending up many slender puberulous stems from a branched rootstock; stipules minute; leaflets small, oblanceolate to obovate; flowers usually few at top of a relatively long peduncle, yellow, finely veined reddish-brown on the standard; keel angled, with a narrow twisted beak, 7–9 mm long; pod very shortly stipitate, oblong-club-shaped, 8–18 mm long; seeds slightly rough.

Grassland, on both red lateritic and black clay soils, 4800–8300 ft. HA, MAC, KAJ.

Bogdan 3458; Pierce in CM 1683.

60. Crotalaria karagwensis *Taub* (*C. lugardiorum* Bullock)

Erect puberulous annual, branched from the base, with simple subsessile linear-lanceolate to oblong-elliptic leaves, and lax racemes of yellow flowers, finely veined reddish-brown on the standard; keel angular, with a narrow twisted beak, 9–11 mm long; pod oblong-club-shaped, 2·7–3·5 cm long.

Open and wooded grassland or bushland, also on cultivated ground, 6000–7600 ft. HE, ?HT, KIT, MUM.

Bogdan 4667; Lugard 197.

61. Crotalaria oocarpa *Bak.*

Bushy annual up to 1 m tall, pilose with fine mostly spreading often yellowish hairs; leaves in tufts, with narrow stipules and oblanceolate to obovate leaflets; racemes both terminal and from the leaf-clusters, the latter with only 1–4 flowers on a slender axis; standard yellow, finely veined reddish-brown; keel angled, with a narrow twisted beak, 1–1·2 cm long; pod ellipsoid, in our area only 8–10 mm long.

Only the subsp. *microcarpa* Milne-Redh., in grassland near Tanzania border. NAR, KAJ.

Bally 1249.

62. Crotalaria spinosa *Benth.* (see p. 304)

Much-branched spiny annual up to 20–70 cm tall, with clustered leaves and small wedge-shaped leaflets; flowers 1–3 on short spine-tipped axes from the leaf-clusters; standard yellow, finely veined reddish; keel angular, with a narrow twisted beak, 4–6 mm long; pod 7·5–9 mm long.

Short grassland, often in disturbed and rather dry places, 5300–7000 ft. HE, HT, KIT, MUM, NAR, RV, MAC, NBI, KAJ.

Bally 5266; Gillett 18315.

63. Crotalaria cephalotes *A. Rich.* (see p. 297)

Small erect coarsely hairy annual, branched from the base, with narrow leaflets and small yellow red-marked flowers in dense terminal heads surrounded by longer spreading leaves; keel angled,

with a narrow twisted beak, 4–5·5 mm long; pods globose-ellipsoid, 2-seeded.

Open and wooded grassland, often in disturbed or rocky places, 3000–7600 ft. HE, KIT, MUM, NAR, RV, MAC, KAJ.

Bally 8979; Drummond and Hemsley 4490.

64. Crotalaria pseudotenuirama *Torre*

Erect pubescent annual, with numerous slender ascending branches, mostly rather small narrowly oblanceolate leaflets and sublax racemes of small yellow flowers, the standard lined reddish-brown and golden-brown tomentose outside; calyx 2·5–3·5 mm long, brownish tomentose; keel angled, with a narrow twisted beak, 4–6 mm long; pod subglobose-ovoid, 5–6 mm long, 1–2-seeded.

Open grassland, 7000–8000 ft. HM.

Scott Elliot 6835.

65. Crotalaria jacksonii *Bak. f.*

Similar to *C. pseudotenuirama*, but the flowers in heads, the calyx 4–5 mm long, with short white appressed hairs, the standard puberulous only at the apex outside and the pod 6–8-seeded.

A rare endemic plant of grassland and forest margins, 8000–9000 ft. HM, HA.

Heriz-Smith in EAH 12858; Kerfoot 4590.

66. Crotalaria hyssopifolia *Klotzsch*

Similar to *C. pseudotenuirama*, but leaflets rather more variable in shape, the flowers often rather closely arranged and sometimes smaller, the calyx and standard pubescent with white appressed hairs and the pod 3–4(–4·5) mm long.

Grassland and forest clearings above 5000 ft. ?HE, KIT, MUM.

Brodhurst-Hill 559; Paulo 522.

67. Crotalaria alexandri *Bak. f.*

Small ultimately much-branched coarsely hairy annual, with small oblanceolate leaflets and little yellow red-marked flowers in short dense terminal racemes and clustered in many of the axils below; keel angled, with a narrow twisted beak, 4·5–6 mm long; pod oblong-ellipsoid, 4–5 mm long, 7–10-seeded.

Grassland and scrub, sometimes in rather dry sites, 4700–5200 ft. MUM, KAJ.

Bally 409; Drummond and Hemsley 4488.

39. LUPINUS *L.*

Erect herbs; leaves digitately 5–11-foliolate; stipels absent; stipules basally fused to the petiole; flowers racemose, variously coloured, often variegated; calyx deeply split, the upper lip 2-lobed, the lower shortly 3-fid; standard broad, the sides reflexing; wings broad, enveloping the beaked keel; stamens all joined into a closed tube, with alternately long and short anthers; ovary sessile; pod oblong, only slightly inflated, often with woody valves constricted between the seeds; seeds oblong-elliptic to squarish, with a small hilum near one end.

Lupinus princei *Harms* (see p. 307)

Bushy herb, with racemes of conspicuous blue and white flowers often yellow marked at centre, and thick-valved furry oblong-pointed pods; seeds squarish, hard, papillate, mottled.

Locally common in grassland, (5000–)6000–8500 ft, the distribution possibly associated in part with old pastoral encampments. HT, HK, RV, KAJ.

Battiscombe 928; Williams 297.

Various other species are cultivated for ornament or green manure, including *L. albus* L., *L. angustifolius* L. and *L. luteus* L., and may become locally naturalized in due course.

40. ARGYROLOBIUM *Eckl. & Zeyh.*

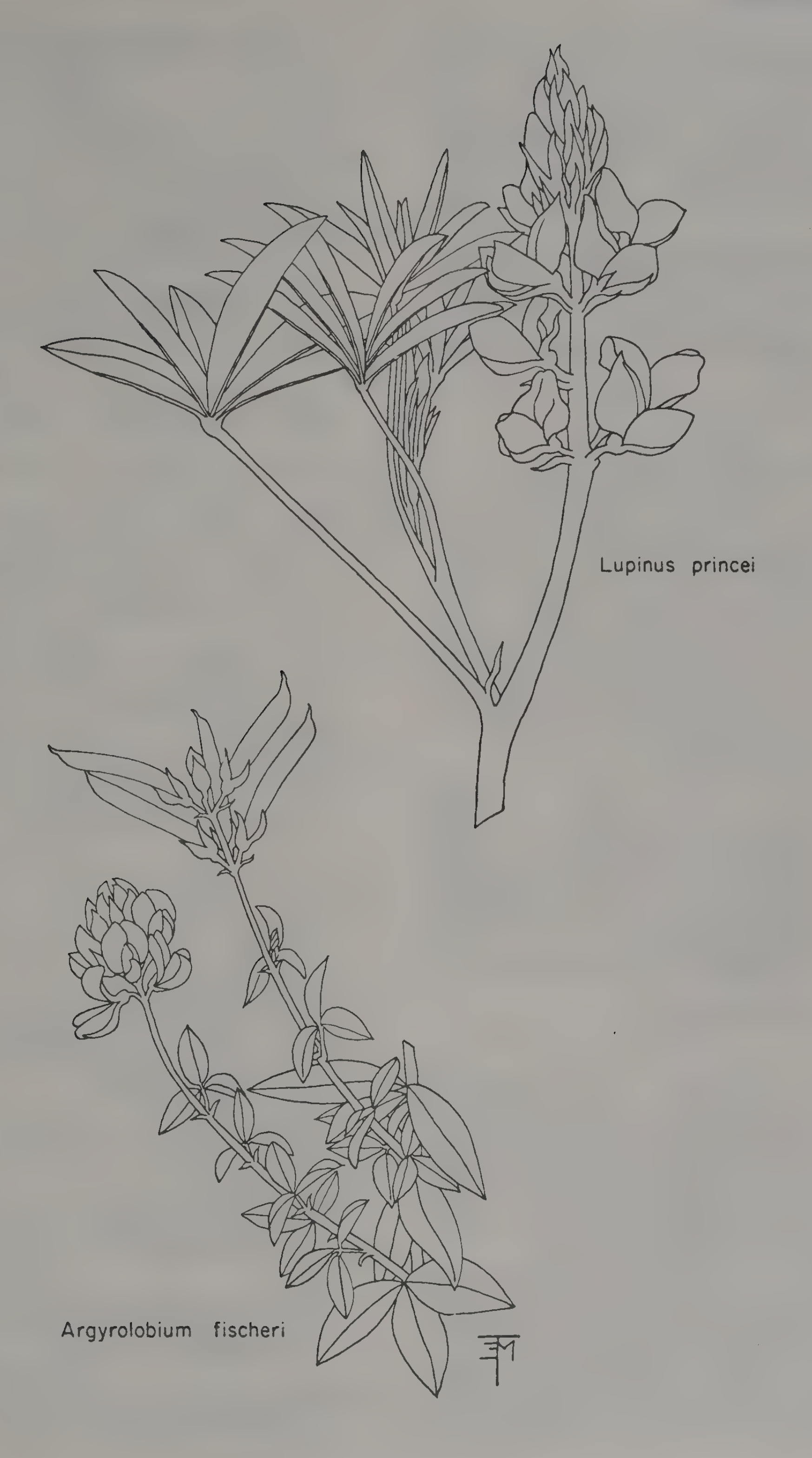
Herbs or small shrubs; leaves digitately 3-foliolate; stipules free or united; flowers in terminal or leaf-opposed generally subumbelliform racemes, yellow, medium-sized, sometimes cleistogamous with all parts much reduced; calyx deeply split, the upper lip 2-lobed, the lower 3-fid; keel slightly incurved, obtuse; stamens united into a generally closed tube, with alternately long and short anthers; ovary sessile; pod linear-oblong, compressed to only slightly inflated, not glandular; seeds oblong-ovate, the hilum small with a minute aril.

NOTE. If shrubby and with glandular pods, see *Adenocarpus mannii* (Hook. f.) Hook. f. in KTS, p. 354.

1 Stipules linear-caudate; upper calyx-lobes subulate; valves of the pod constricted between the seeds — 4. *A. ramosissimum*
  Stipules lanceolate to ovate, acuminate; upper calyx-lobes oblong-lanceolate; valves of pod continuous over the seeds — 2
2 Stipules joined along the leaf-opposed margin — 2. *A. friesianum*
  Stipules free except at very base — 3
3 Racemes ± 6–40-flowered; robust woody herb or subshrub, 30–200 cm tall — 1. *A. fischeri*
  Racemes ± 1–4-flowered; low diffuse slender-stemmed herbs — 3. *A. rupestre*

1. Argyrolobium fischeri *Taub.* (see p. 307)

Bushy often somewhat woody plant, erect to 1–2 m (smaller in burned and grazed places), with


Lupinus princei
Argyrolobium fischeri

generally tomentose elliptic leaflets, free lanceolate or ovate stipules and congested 6-40-flowered racemes.

Forest margins, bushland, and grassland, 5000-8000 ft. HE, HC, HM, HA, HK, KIT, MUM, KIS, RV, MAC, NBI.

Chater-Jack 118; Graham LC 956 in FD 3038.

2. Argyrolobium friesianum *Harms*

Similar to *A. fischeri*, but even more robust and with the stipules united for most of their length along the leaf-opposed margin.

Forest, sometimes at margins, 8000-10 000 ft. HM, HA, HK.

Bally 4568; Gardner in FD 1114.

3. Argyrolobium rupestre (*E. Mey.*) *Walp.*

Creeping or shortly ascending perennial, with many slender stems only up to 1(-2) mm in diameter, ± elliptic hairy leaflets, free lanceolate or ovate stipules and only 1-4 flowers per raceme.

Two races—one with prostrate stems and sparsely hairy calyx on the Aberdare and Mt. Kenya moorlands (subsp. *aberdaricum* (Harms) Polhill), the other with ascending stems and tomentose calyx more widespread in grassland below the forests (subsp. *kilimandscharicum* (Taub.) Polhill). HC, HT, HM, HA, HK, RV.

Chandler 2343; Polhill 234.

4. Argyrolobium ramosissimum *Bak.*

Straggling slender-stemmed perennial, with generally elliptic-obovate sparsely hairy leaflets, very narrow free stipules, and congested 1-12(-16)-flowered racemes; pods distinctly constricted between the seeds.

Forest margins and ericaceous moorland. HC, HM.

Kerfoot 2944; Rawlins 7.

41. TRIFOLIUM *L.*

Herbs with (in ours) digitately trifoliolate, denticulate leaves; stipels absent; flowers often aggregated into umbels or dense racemes; petals persistent after anthesis, adnate to stamen sheath at base; stamens with 9 fused and 1 free, all fertile; pod indehiscent, enclosed by dry remains of calyx and corolla, 1-2 (less often -9)-seeded.

1 Bracts 1- or few-nerved, usually much shorter than the calyx which is not or hardly inflated and usually splits dorsally in fruit; blade of wing auriculate — 2
Bracts several-nerved, more than half as long as calyx, forming an involucre; calyx 25-50-nerved, somewhat inflated and splitting irregularly in fruit; blade of wing not auriculate, tapering gradually into the claw — 16

2 Petiole of each leaf united with stipules throughout its length; ovules 2 — 3
Petiole free for most of its length, at least in the lower leaves — 7

3 Pedicels not conspicuously reflexed in fruit, shorter than the calyx tube; corolla usually purple — 4
Pedicels conspicuously reflexed in fruit, those of the upper flowers longer than the calyx tube; corolla white or pinkish — 5. *T. cheranganiense*

4 Leaflets linear-lanceolate, usually more than 5 times as long as wide, calyx nerves 15-20 — 1. *T. simense*
Leaflets rarely more than 5 times as long as wide; calyx nerves 11 — 5

5 Leaflets usually over 9 mm long; inflorescence oblong at least in fruit — 6
Leaflets 2-9 mm long, cuneate-obovate, truncate or emarginate, inflorescence hemispherical *c.* 15 mm across; standard *c.* 9 mm long — 4. *T. cryptopodium*

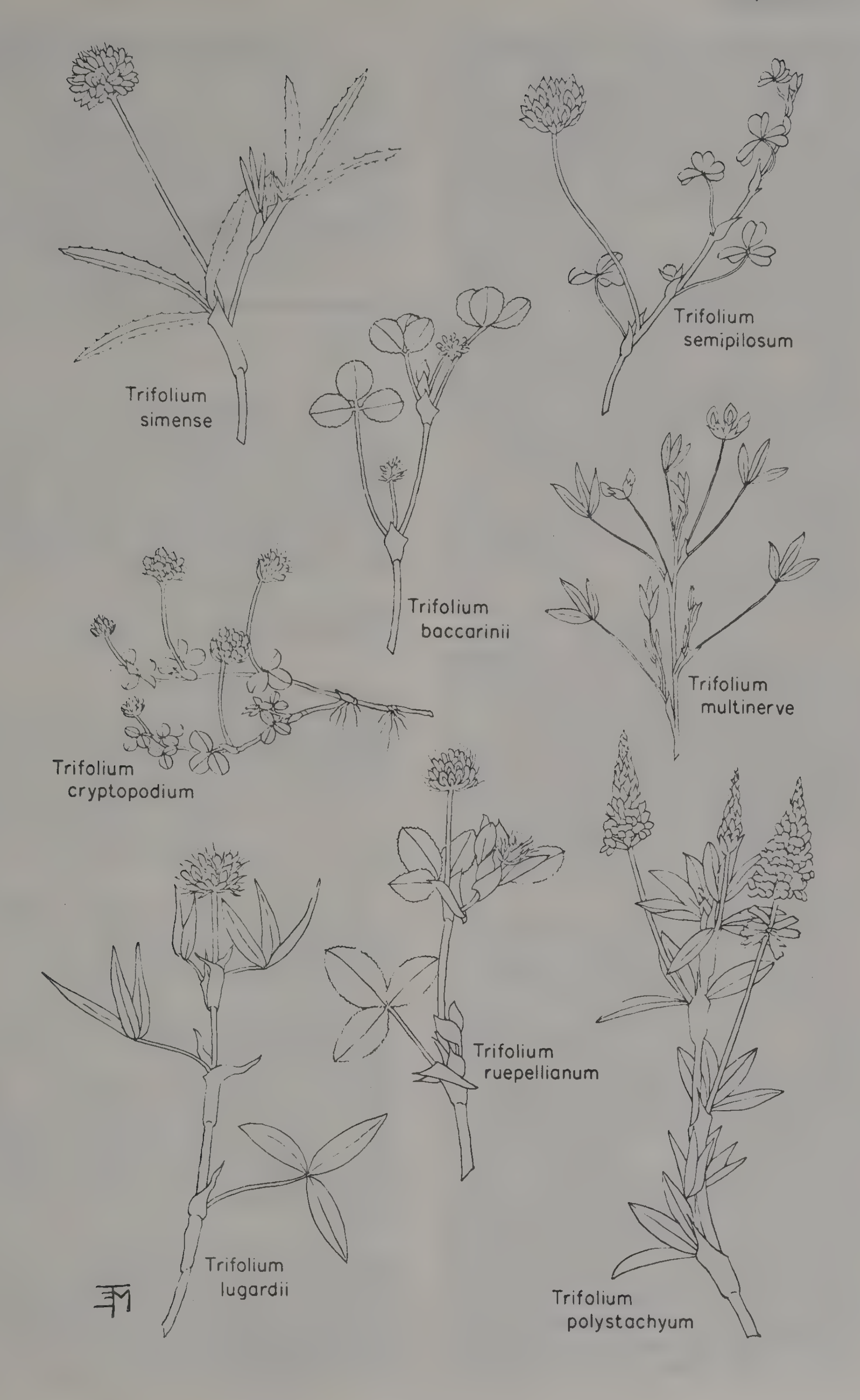
6 Leaflets 12-32 mm long, usually acute; standard 7 mm long or more; inflorescence 12 mm or more across and more than twice as long — 2. *T. polystachyum*
Leaflets 6-22 mm long, usually emarginate, truncate or rounded; standard up to 7 mm long; inflorescence, even in fruit, under 18 mm long, 10-12 mm across — 3. *T. usambarense*

7 Calyx with fewer than 15 nerves (usually 11); ovules 2-9 — 8
Calyx with 15-25 nerves, somewhat inflated in fruit; 1-6 flowers per inflorescence; ovules 5-9 — 15

8 Pedicels conspicuously reflexed after flowering, those of the upper flowers usually more than 2 mm long and longer than the calyx tube; corolla white or pinkish, perennial — 9
Pedicels not reflexed after flowering, rarely over 2 mm long; corolla purple or crimson, rarely white — 10

9 Free part of petiole absent in the upper leaves, not over 1·5 cm long in the lower leaves, less than twice as long as a leaflet — 5. *T. cheranganiense*
Free part of petiole always present, often over 1·5 cm long and often more than twice as long as a leaflet — 6. *T. semipilosum*

10 Peduncle longer than the inflorescence which nearly always has more than 5 flowers — 11


Trifolium simense
Trifolium semipilosum
Trifolium baccarinii
Trifolium multinerve
Trifolium cryptopodium
Trifolium ruepellianum
Trifolium lugardii
Trifolium polystachyum

Peduncle shorter than the 1–5-flowered inflorescence; perennial 12. *T. acaule*

11 Calyx teeth 1–1·5 mm wide at base, narrowing gradually with a broad scarious margin; inflorescence 3–15-flowered; standard 8–10 mm long, widest at the middle, then abruptly narrowed to an oblong, downward inflected, truncate tip; ovules 4–8, rarely 2 or 3 11. *T. tembense*

Calyx teeth not over 1 mm wide at base; inflorescence usually more than 1-flowered; standard more or less oblong, straight or bent upwards 12

12 Perennial; stem creeping, rooting at the nodes; free part of petiole always well developed; peduncle usually 5–10 times as long as subtending leaflets; standard 7 mm long or more; ovules 2, rarely 3 or 4 7. *T. burchellianum*

Annuals; stem ascending or, if prostrate, rarely rooting at the nodes, free part of petiole often very short in uppermost leaves; peduncle rarely 5 times as long as subtending leaflets 13

13 Commissural calyx nerves forking at a wide angle (*c.* 120°) at the base of the sinus; calyx teeth abruptly narrowed at the base; pedicel shorter than the calyx tube; standard 5–8 mm long; leaflets rarely emarginate, usually strongly toothed 14

Commissural calyx nerves usually forking at an angle of less than 90° low down the tube; calyx teeth gradually narrowing from the base; pedicel as long as calyx tube; standard 3–4 mm long; leaflets usually emarginate with numerous small teeth; ovules 2 10. *T. baccarinii*

14 Stipules entire; leaflets oval, oblong or obovate, rarely lanceolate, less than 3 times as long as wide, rarely acute; calyx glabrous or with a few hairs on the margin; ovules 2–3, rarely 4 or 5 8. *T. rueppellianum*

Stipules usually somewhat laciniate; leaflets lanceolate, acute, 3 or more times as long as wide; calyx sparsely pilose, the hairs not confined to the margin; ovules 2 9. *T. lanceolatum*

15 Peduncle 1–4 cm long bearing 1–6 flowers; leaflets oblanceolate 13. *T. multinerve*

Peduncle absent, flowers single or 2 together in leaf axils on pedicels 0–1·5 mm long; leaflets obovate 14. *T. elgonense*

16 Corolla shorter than calyx, *c.* 9 mm long; calyx teeth 6–7 mm long; flowers usually more than 20 per head 15. *T. lugardii*

Corolla longer than calyx, 7–8 mm long; calyx teeth 2–4 mm long; flowers 10–20 per head 16. *T. steudneri*

1. Trifolium simense *Fres.* (see p. 309)

Perennial, often with thick fleshy roots, with stems more or less erect; leaflets narrowly cuneate-oblong or linear-lanceolate; inflorescence many-flowered, hemispherical or ovoid; pedicels erect in fruit; calyx tube 17–20-nerved; corolla reddish purple, or rarely, white; seeds 1–2.

Upland grassland, 6000–9000 ft. HC, HT, HM, HA, KIT.

Knight 56; Bogdan 2009.

2. Trifolium polystachyum *Fres.* (see p. 309)

Perennial, roots fibrous, stems up to 80 cm tall and 3 mm wide, often creeping and rooting at the nodes near the base; leaflets elliptic or oblanceolate, rounded or acute at the apex; inflorescence many-flowered, oblong; pedicels ascending in fruit; calyx 11-nerved; corolla purple; seeds 1–2.

Swampy grassland and forest margins, 5500–7500 ft. HC, ?HT, KIT.

Thulin and Tidigs 153; Symes 637.

3. Trifolium usambarense *Taub.*

Annual or short-lived perennial with fibrous roots; stems ascending, up to 1 m long but usually much less, about 1·5 mm wide, often rooting at the lower nodes; leaflets cuneate-oblanceolate, usually truncate or rounded at the tip; inflorescence more or less oblong, pedicels ascending in fruit; calyx 11-nerved; corolla purple, or rarely white; pod usually 2-seeded.

Marshy places and openings in forest, at the lower altitudes only by streams, 4500–8300 ft. HE, HT, HM, HL, HA, HK, KIT, KIS.

Bogdan 3786; Copley in CM 17261.

4. Trifolium cryptopodium *A. Rich.* (*T. kilimandscharicum* Taub.) (see p. 309)

Perennial, the rootstock sometimes thick and rather woody; stems creeping in their lower portions, rooting at the nodes and often forming mats; leaflets cuneate-obovate; inflorescence hemispherical, pedicels ascending in fruit; calyx 11-nerved; corolla purple; pod 1- or less often 2-seeded.

Often abundant in grassy places above the treeline, especially on rocky ground, also in moist forest openings, 6500–12 000 ft. Intermediates between this species and *T. usambarense* occur. HE, HC, HT, HM, HA, HK.

Bogdan 4968; Napper 754.

5. Trifolium cheranganiense *Gillett*

Perennial with a stout tap-root and prostrate pubescent stems; leaflets cuneate or cuneate-oblong, rounded or emarginate at the apex; inflorescence globose, pedicels reflexed in fruit; calyx pilose, 11-nerved; corolla white or pale pink; pod 1–2-seeded.

Locally abundant in upland grassland, especially where heavily grazed, 6500–9500 ft. HC.

Thulin and Tidigs 267; Thorold 2759.

6. Trifolium semipilosum *Fres.* (*'Kenya wild white Clover'*) (see p. 309)

Perennial with a strong taproot and prostrate pilose stems often rooting at the nodes; leaflets orbicular, elliptic, oblong-elliptic, ovate or cuneate-obovate, rounded truncate or emarginate at the tip, glabrous above but pilose (sometimes very sparsely so) at the margins, on the mid-ribs and usually on the lower but not the upper halves of the two lateral leaflets beneath; inflorescence more or less globose, pedicels reflexed in fruit; calyx 11-nerved; corolla white or pale pink; pod 2–5-seeded.

Often abundant in upland grassland, 4600–9000 ft. HC, HT, HM, HA, HK, KIT, KIS, NAR, RV, NAN, MAC, NBI, KAJ.

The commoner form in moister areas, (var. *glabrescens* Gillett) has cuneate obovate emarginate leaflets with a very sparse indumentum. It has often been confused with the European *T. repens* L. which has been introduced into Kenya as a pasture plant at high altitudes.

Agnew and Humphry 5567.

7. Trifolium burchellianum *Ser.* (*T. johnstonii* Oliv.) (see p. 264)

Perennial with a tap-root, stems glabrous or nearly so, creeping and rooting at the nodes, or, less often, ascending; leaflets glabrous or nearly so, mostly cuneate-obovate, cuneate-oblong, or cuneate-elliptic-emarginate, or, less often, truncate or rounded at the tip; inflorescence many-flowered, more or less globose; pedicels stout, ascending in fruit; calyx 11-nerved, the teeth triangular for 0·5 mm at the base, then subulate; corolla purple; pod 1–2-seeded.

Moist upland grassland, moist forest, or moorland openings, rare in the alpine zone, 5500–10 500 ft. HE, HC, HT, HM, HA, HK, KIS.

Bally 6473; Bogdan 4966.

8. Trifolium rueppellianum *Fres.* (*T. subrotundum* A. Rich., *T. preussii* Bak. f.) (see p. 309)

Annual with glabrous, erect, or less often, prostrate stems, not rooting at the nodes; leaflets glabrous, or nearly so, oval, oblong or obovate, rarely broadly lanceolate, less than 3 times as long as wide, rounded, usually truncate; inflorescence more or less globose, usually 15–30-flowered, (few-flowered and smaller in stunted plants at high altitudes) ascending in fruit; calyx 11-nerved, glabrous except for a few hairs at the margins; teeth abruptly narrowed near the base; corolla purple or rarely white; pod 2–3-, rarely up to 5-seeded.

Upland grassland, moorland, tracks in forest or a weed in cultivated land, usually in rather wet places, 5000–11 000 ft. HE, HC, HT, HM, HA, KIT, KIS, RV, KAJ.

Irwin 305; Mwangangi 218.

9. Trifolium lanceolatum (*Gillett*) *Gillett* (*T. rueppellianum* Fres. var. *lanceolatum* Gillett)

A more or less erect annual resembling *T. rueppellianum* except for the usually toothed stipules, the lanceolate very acute leaflets with prominent whitish nerves and well marked teeth, and the pilose calyx; corolla purple about 5 mm long; pod 1–2-seeded.

Upland grassland and a weed in cultivation, 7300–8500 ft. HM, HA.

Bogdan 3178; Albrechtsen 2749.

10. Trifolium baccarinii *Chiov.* (see p. 309)

Annual, stems often prostrate, sometimes rooting at the nodes; easily confused with *T. rueppellianum* but the leaflets, which are elliptic or obovate, are usually emarginate, the calyx tapers to the base, and has commissural nerves which fork low down, well below the margin, and gradually tapering teeth; corolla purple, 3–4 mm long; pod 1–2-seeded.

Heavily grazed grassland, 5000–5500 ft. MUM, KIS.

Bogdan 4546; Drummond and Hemsley 4749.

11. Trifolium tembense *Fres.* (*T. umbellulatum* A. Rich. *T. goetzenii* Engl.)

Glabrous or subglabrous annual or short-lived perennial, sometimes rooting at the nodes when growing in water; leaflets elliptic or obovate, acute, rounded truncate or slightly emarginate at the apex, the teeth well developed; inflorescence hemispherical 3–16-flowered; pedicels ascending in fruit; calyx sparsely pilose at the margins only, broadly campanulate, strongly 11-nerved, the teeth gradually narrowing from the base; corolla purple about 9 mm long, the standard abruptly narrowed above the middle into an oblong truncate down-curved tip; pod usually 4–6-seeded.

Wet places in upland grassland, forest or moorland openings and in the alpine zone, 6000–11 500 ft. HE, HT, HA, HK, KIT, KIS.

Symes 163; Knight 55.

12. Trifolium acaule *A. Rich.*

Perennial with a tap-root and close-pressed prostrate branches rooting at the nodes; leaflets cuneate-obovate, slightly toothed; inflorescence 1–5-flowered; calyx 11-nerved, with triangular teeth; corolla mauve, about 8 mm long; pod 1–4-seeded.

Locally abundant, in short grass and rock crannies in the alpine zone, 10 000–12 000 ft. HE.

Gillett 18478; Knight 50.

13. Trifolium multinerve *A. Rich.* (see p. 309)

Annual or short-lived perennial, stems erect and up to 20 cm tall, if procumbent not rooting at the nodes; leaflets oblanceolate, acute, or rarely rounded at the tip; inflorescence pedunculate 1–6-flowered; pedicel erect; calyx-tube 3–4 mm long, 15–30-nerved, rather inflated in fruit but splitting dorsally, the teeth triangular-subulate, about as long as the tube; corolla purple, 7–8 mm long; pod up to 9-seeded.

Short upland grassland and moorland, especially in wet places, 5500–11 000 ft. HE, HC, HT, HM, HK.

Gillett 18407; Thulin and Tidigs 83.

14. Trifolium elgonense *Gillett*

Differs from *T. multinerve* in the shorter cuneate-obcordate leaflets, the peduncle under 1 mm long so that the flowers are sessile in the leaf axils, and the calyx teeth 2–2·5 mm long, shorter than the tube which is inflated in fruit and seems not to split dorsally.

Wet open places in the upper forest, moorland, and alpine zones, 8300–10 500 ft. HE.

Gillett 18409; Bogdan 5392.

15. Trifolium lugardii *Bullock* (see p. 309)

Erect sub-glabrous annual up to 60 cm tall; leaflets lanceolate or narrowly oblong, rounded or acute at the tip; inflorescence subglobose, about 30-flowered, outer bracts forming an involucre; calyx-tube about 30-veined, inflated and splitting irregularly in fruit, the teeth narrowly triangular, subulate at the tip, exceeding the purple corolla; pod 4-seeded.

Upland grassland and forest margins, especially in damp places, 5500–7750 ft. HE, KIT.

Irwin 307; Tweedie 81.

16. Trifolium steudneri *Schweinf.* (see p. 264)

Annual herb, differing from *T. lugardii* in the pedicels under 1 mm long and the calyx with triangular teeth shorter than the corolla.

Upland grassland, especially in damp places, 5500–7500 ft. HE, HA, KIT, RV.

Bogdan 3222; Hedberg 37.

42. PAROCHETUS *D. Don*

Monotypic, distinguished from *Trifolium* by the stipules almost free from the petiole, the long pedicels, the caducous corolla and the slightly inflated 10–15-seeded pod, 3–4 times as long as the calyx.

Parochetus communis *D. Don*

Prostrate, glabrous or sparsely pilose herb, rooting at the nodes; leaves digitately trifoliolate on long petioles; stipules oval, acute, scarious, leaflets cuneate-obovate, entire, crenate or coarsely toothed; inflorescence a (1–)2(–4)-flowered umbel; bracts brown, scarious, 2–4 mm long; calyx 6–7 mm long, divided to the middle into ovate acute unequal teeth, the upper pair united almost to the tip; corolla glabrous, bright blue, up to 17 mm long; pod glabrous, on deflexed pedicels, thin-walled with numerous fine branching transverse veins, usually not dehiscing until forced open by the germinating seeds.

Forests, especially in moist places, and forest clearings usually on soils of volcanic origin, 6500–10 250 ft. Cleistogamous flowers have been reported for this species in the Himalayas, but seem not yet to have been observed in Kenya. HM, HA, HK, HN, KAJ (Chyulu Hills).

Kerfoot 455; Verdcourt 3265.

43. MELILOTUS *Mill.*

Annual or biennial, more or less fragrant herbs; leaves pinnately trifoliolate; stipules adnate to the petiole; stipels absent; leaflets toothed; flowers small, yellow or white, in elongated spike-like axillary racemes; corolla caducous, glabrous, free from the stamens; pod small, 1–2-, or rarely, 3–4-seeded.

Introduced into East Africa.

1 Style 0·9–1·2 mm long; stipules sometimes denticulate at the base — 1. *M. indica*
  Style 1·7–2·3 mm long; stipules entire — 2
2 Pod strongly transverse-veined, the veins rugose; corolla yellow — 2. *M. officinalis*
  Pod with a weak irregular vein-network; corolla white — 3. *M. alba*

M. suaveolens Ledeb., resembling *M. alba* but with yellow flowers, has become common locally in the Serengeti plains (Tanzania) and may be expected from the Kenya side of the border.

1. Melilotus indica (*L.*) *All.*

Weed in cultivated areas, 6000 ft. KIT.

Newton 1144 and EAH253/55.

2. Melilotus officinalis (*L.*) *Pall.*

Weed in cultivated areas, 6500 ft. HA.

Kulkarni in EAH 14116.

3. Melilotus alba *Desr.*

Grassland and abandoned fields, 5000–6000 ft. KIS, RV.

Bally 6205; Bush in EAH 391/63.

44. MEDICAGO *L.*

Herbs; leaves pinnately trifoliolate; stipules adnate to the petiole, toothed or laciniate; stipels absent; leaflets toothed; inflorescence a short, condensed, often subglobose, pedunculate axillary raceme; pedicels and bracts short; calyx short with 5 subequal teeth; corolla under 1 cm long, caducous, glabrous, yellow or, less often, purplish-blue; pod longer than the calyx, bent through a circle, or through several spiral coils.

1 Pod 1-seeded, of 1 turn only, without spines; racemes 5–20-flowered; leaflets less than twice as long as wide; stipules with short broad teeth 1. *M. lupulina*

Pod *c.* 5-seeded, of 3 or 4 turns, with hooked spines; racemes 1–2-flowered; leaflets usually more than twice as long as wide; stipules laciniate 2. *M. laciniata*

M. sativa L., Lucerne or Alfalfa, an erect herb with blue-purple flowers is commonly grown for fodder. Several other species have been grown experimentally.

1. Medicago lupulina *L.*

A more or less pubescent prostrate or ascending yellow-flowered annual or short-lived perennial.

Probably not native, a weed in cultivation and in lawns; 6000–6500 ft. HA, RV, NBI.

Bally 1433; Roberts in EAH 181/55.

2. Medicago laciniata (*L.*) *Mill.*

Spreading subglabrous, or sparsely pilose, yellow-flowered annual. Very likely native in short grassland, especially where seasonally waterlogged, 5000–7650 ft. RV, NAN, MAC, NBI, KAJ.

Gillett 18336; Agnew and Musumba 5334.

45. LOTUS *L.*

Herbs (in our area perennial) or softly woody subshrubs; leaves imparipinnate, the petiole absent or very short; leaflets (in our area) 5, the basal pair usually different in shape from the others and resembling foliaceous stipules; stipels absent; inflorescence an axillary or terminal, usually pedunculate, umbel subtended by a 1–3-foliolate leafy bract; corolla glabrous, in our species not over 10 mm long; dorsal stamen free; 5 of the 9 united stamens longer than the others, their filaments dilated at the tip; pod narrow, subcylindrical, dehiscing into 2 twisted valves, usually septate within, in our area glabrous, straight, up to 3 cm long, 5–25-seeded.

In the following account the 'basal angle' of a leaflet is that formed between its two edges as they converge.

1 Peduncle, like the rest of the plant, glabrous, or almost so; corolla bright yellow often marked with red; umbels 1–2- or rarely 3-flowered; free parts of shorter filaments half as long as those of longer filaments 1. *L. corniculatus*

Peduncle pubescent; corolla white, cream, or pale yellow, marked with pink or crimson; umbels 1–8-flowered; free parts of shorter filaments more than half as long as those of longer filaments 2

2 Leaf rachis 4–7 mm long, more than half as long as the basal leaflets which are almost as broad as long, usually have a basal angle of over 100°, often of nearly 180°, and are glabrous or with a few spreading hairs at the margins only 2. *L. becquetii*

Leaf-rachis usually under 4 mm long, less than half as long as the basal leaflets which are usually much longer than broad, have a basal angle of less than 100° and are pubescent, at least on the lower surface 3

3 Some of the hairs on most parts of the plant usually laxly spreading and up to 1 mm long; basal leaflets less than twice as long as wide, much less narrowed at the base than the 3 terminal leaflets which are rarely more than 2·5 times as long as wide 3. *L. goetzei*

Hairs all appressed, about 0·5 mm long; basal leaflets often more than twice as long as wide, narrowly wedge-shaped at the base like the terminal leaflets which are often 3 times as long as wide 4. *L. discolor*

1. Lotus corniculatus *L.* (*L. mearnsii* De Wild. non Britton; *L. friesiorum* Harms)

Glabrous, or almost so; stems weak, slender; leaflets drying a pale yellowish-green without red flecks, the basal pair distinctly broader at the base than the others, with a basal angle usually exceeding 100°.

Grassland, especially where seasonally wet, 6000–8000 ft, and common around Lake Naivasha HA, RV.

Verdcourt 3677; Bogdan 3221.

2. Lotus becquetii *Boutique* ('*L.* sp. near *tigrensis*' in Jex-Blake 'Some wild flowers of Kenya') (see p. 264)

Stems slender, weak, straggling; drying a pale yellowish-green without red flecks.

Grassland and rocky hillsides, 6000–8500 ft. HE, HC, HA, RV.

Thulin and Tidigs 191; Gardner 2014.

3. Lotus goetzei *Harms* (*L. tigrensis* sensu Bak. f. pp. non Bak. *L. oehleri* Harms) (see p. 264)

Stems spreading or ascending or often erect and bushy, stouter than in the other species, up to 3 mm in diameter, drying dark green with numerous reddish flecks which darken with age.

Grassland, open bushland and forest margins, especially on recent volcanic soils, 5250–8250 ft. HE, HM, HA, RV, NAN, NBI.

Verdcourt 694; Greenway 5994.

4. Lotus discolor *E. Mey.* (*L. tigrensis* Bak.)

Dries a less dark green than *L. goetzei*, the leaflets are paler below than above and usually have sparse or numerous reddish flecks which are hardly apparent at first but darken with age.

Fire-swept grassland with scattered *Erythrina*, 5200–6000 ft. KAJ (Chyulu Hills).

Bally 8249; Gillett 18852.

46. ANTOPETITIA *A. Rich.*

Monotypic, distinguished by the remarkable fruits.

Antopetitia abyssinica *A. Rich.* (see p. 262)

Spreading or erect tap-rooted annual, or short-lived perennial, 20–120 cm tall; leaves imparipinnate; stipules reduced to glands, petiole very short or nil; leaflets 5–11, alternate or subopposite, linear-lanceolate; inflorescence an axillary pedunculate 2–8-flowered umbel, usually with a foliaceous bract half way up the peduncle, or above; floral bracts and bracteoles minute, caducous; receptacle obconical, calyx teeth acute, subequal, 2–3 mm long; corolla glabrous, yellow or orange, about 4 mm long; style under 1 mm long; pod glabrous, shortly stipitate, curved, 2–5-seeded, up to 1 cm long, composed of spherical 1-seeded segments each splitting into two valves which separate from the persistent upper suture.

Upland grassland, moorland, and open bushland, 5100–10 500 ft. HE, HC, HT, HM, HA, KIT, RV, MAC, NBI, KAJ (Chyulu Hills).

Mwangangi 386; Bogdan 19194.

47. GALEGA *L.*

Erect or ascending herbs; leaves imparipinnate; stipules usually divided, one lobe pointing downwards; leaflets entire; stipels absent; flowers in dense pedunculate racemes; bracts narrow, rather persistent; calyx campanulate with equal subulate-tipped teeth; corolla glabrous, blue; filaments rather persistent, united into a tube; pod ascending, 2–5-seeded, unilocular, dehiscent, not inflated, the sutures not impressed, elliptic or rhombic-lanceolate, curved away from the rhachis near the tip, with a close network of prominent parallel veins sloping upwards towards the style-base.

1 Leaflets up to 20 mm long and 6 mm wide; hairs on the inflorescence-rachis long, weak, not glandular; standard 6 mm long; pod up to 25 mm long 1. *G. lindblomii*
  Leaflets up to 45 mm long and 20 mm wide; hairs on the inflorescence-rachis short, stiff, erect, gland-tipped; standard 9–13 mm long; pod up to 35 mm long 2. *G. battiscombei*

1. Galega lindblomii (*Harms*) *Gillett* (*Astragalus somalensis* Harms var. *lindblomii* Harms; *A. tridens* Jex-Blake (name invalidly published)) (see p. 315)

Annual or short-lived erect perennial up to 1·5 m tall. Mountain grassland, forest margins and bamboo thickets 6500–7000 ft. HE, HC.

Lugard 2900; Gillett 18423.

2. Galega battiscombei (*Bak. f.*) *Gillett* (*Astragalus battiscombei* Bak. f.)

More luxuriant than *G. lindblomii* with weak sprawling stems up to 2 m long. Damp places in forests and at forest margins, 6000–7250 ft. HK.

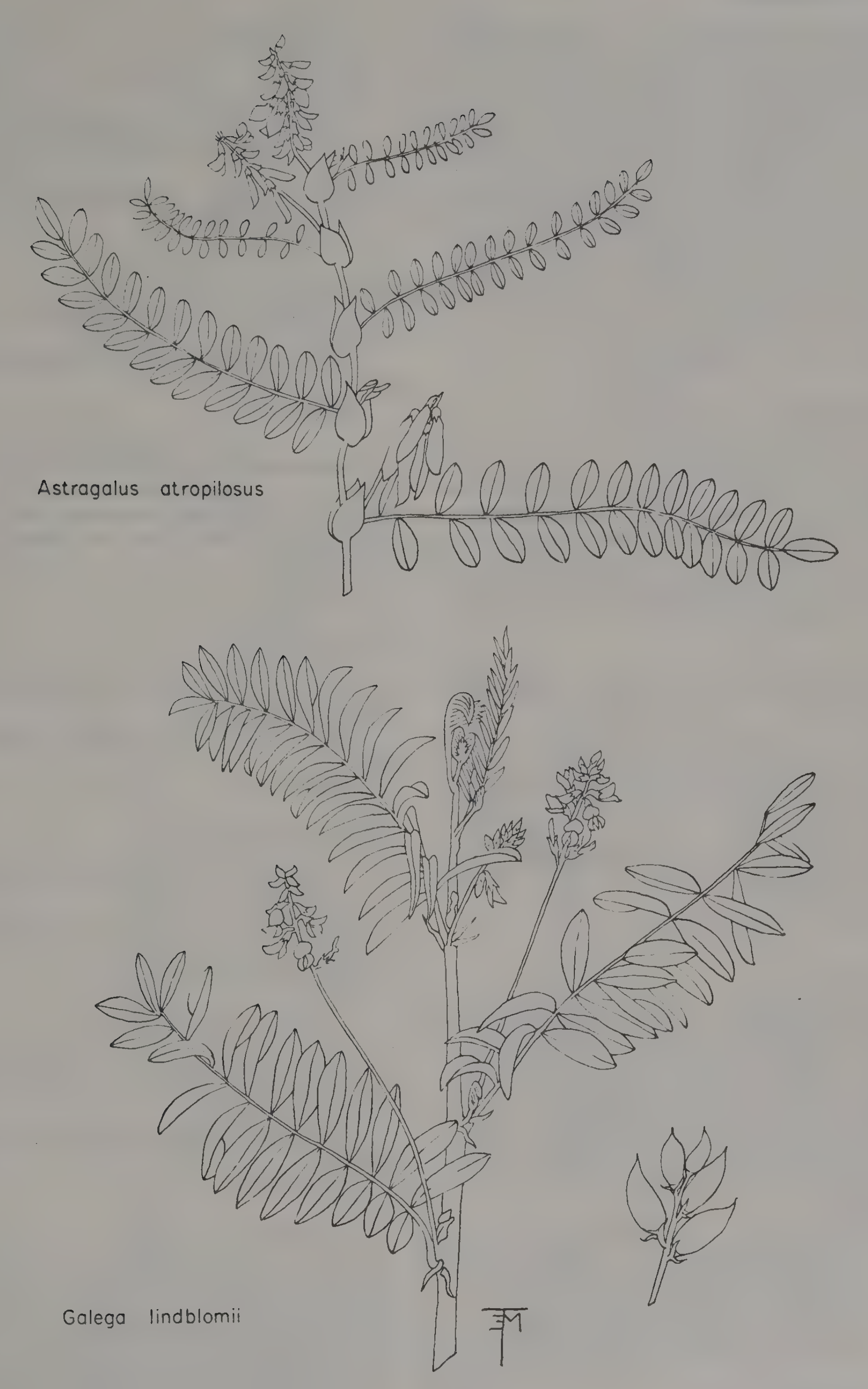
Battiscombe 709; Rendle 640.

48. ASTRAGALUS *L.*

Herbs (or subshrubs), leaves imparipinnate; stipules entire, rather persistent, often large; flowers in axillary racemes; calyx tubular (or inflated); corolla nearly always glabrous; dorsal filament free; style filiform, glabrous; stigma small, terminal; pod often inflated but hardly so in our species, more or less completely divided into two compartments by a double membrane arising from the lower (abaxial) suture, which is normally impressed (but hardly so in our species); seeds small, kidney shaped, with threadlike funicles.

Astragalus atropilosulus (*Hochst.*) *Bunge* (*A. abyssinicus* A. Rich.; *A. venosus* A. Rich.; *A. bequaertii* De Wild.; *A. elgonensis* Bullock; *A. burkeanus* Harv.) (see p. 315)

Perennial, or perhaps sometimes biennial, subglabrous or pubescent herb up to 1·5 m tall; leaves up to 25 cm long with 11–51 leaflets; stipels absent stipules foliaceous, persistent, cordate at one side at the base, often larger than a leaflet; racemes pedunculate, many-flowered, the pedicels deflexed in fruit; corolla (in our area) purplish and greenish at the base; pod stipitate, lanceolate, with 4–8 seeds in each compartment, up to 4 cm long, up to 7 mm wide (including the stipe).


Astragalus atropilosus
Galega lindblomii

Grassland, open bushland, forest margins, rarely in moorland, 5300–12 500 ft. A very variable species with several subspecies and varieties in the highlands from Eritrea to the Transvaal. In Kenya the main distinction is between subsp. *bequaertii* (De Wild.) Gillett in the west and on the Aberdares with pods less than 4·5 times as long as wide, whose stipe is usually under 3 mm long, and subsp. *burkeanus* (Harv.) Gillett in central and southern Kenya with pods more than 5 times as long as wide, whose stipe is over 3 mm long. HE, HC, HT, HM, HA, HK, KIT, MUM, NAR, RV, MAC, NBI, KAJ.

Glover *et al.* 249; Gillett 16748.

49. COLUTEA *L.*

Softly woody shrubs; leaves imparipinnate, stipules small; flowers few together in axillary racemes; calyx with 5 subequal teeth much shorter than the tube; corolla over 1 cm long, glabrous, yellow, reddish or brown; style thick, bearded inside near the top and incurved at the tip; pod stipitate, inflated, many-seeded, splitting at the tip only or indehiscent; seeds small with long funicles.

Colutea abyssinica *Kunth & Bouché* (*C. haleppica* Auct. non Lam.; *C. istria* Auct. non Mill.) (see p. 274)

Leaflets 9–15; racemes 2–3-flowered; corolla chocolate-coloured, yellowish at the base, 13–15 mm long; pod papery, 3–8 cm long, including the 5–22 mm long stipe.

Montane grassland, evergreen bushland, and forest margins, 6000–8500 ft. HE, HT, HM, HA, HK, KIT, RV, KAJ.

Lugard 271; Gardner 1466.

50. VICIA *L.*

Annual or perennial climbing (rarely erect) herbs with pinnate leaves usually ending in a tendril; stipules often sagittate; stipels absent; inflorescence axillary, racemose; bracts small; bracteoles absent; calyx 5-lobed, with the tube often oblique; corolla blue, purple or yellow; stamens (10) or (9) + 1; anthers uniform; ovary 2-many-ovuled; style usually hairy, rarely glabrous; pods oblong to linear, compressed.

1 Flowers solitary or few, subsessile in the upper leaf axils — 1. *V. sativa*
  Flowers in pedunculate racemes, or, if solitary, then on long peduncles — 2
2 Pods about 1 cm long; flowers solitary — 2. *V. hirsuta*
  Pods much longer than 1 cm; flowers in racemes — 3
3 Pods glabrous — 4
  Pods hairy — 5
4 Leaflets in 4–12 pairs — 3. *V. villosa*
  Leaflets in 2–3 pairs — 4. *V. paucifolia*
5 Racemes as long as or shorter than the subtending leaves; plant densely pubescent — 5. *V. benghalensis*
  Racemes mostly longer than the leaves; plant glabrescent — 3. *V. villosa*

1. **Vicia sativa** *L.* (see p. 317)

A trailing herb with 5–8 pairs of linear leaflets to each leaf and solitary blue flowers.

Locally common in highland grassland. HE, HC, HM, HA, KIT, RV.

Bogdan 1983.

2. **Vicia hirsuta** (*L.*) *S. F. Gray* (see p. 317)

Similar to *V. sativa* but a smaller plant with smaller paler flowers on long peduncles.

Uncommon plant found in highland grassland. HE, HT, HM, HA.

Irwin 204.

3. **Vicia villosa** *Roth*

A pubescent climber with 4–12 pairs of linear leaflets to each leaf and long racemes of bright purple and blue flowers.

A local escape from upland cultivation. HC, HM.

Bogdan 3188.

4. **Vicia paucifolia** *Bak.*

A hairy climber with up to 3 pairs of linear leaflets to each leaf and long pedunculate racemes of pale blue flowers.

An indigenous species of upland grassland and forest edges. HE, HT, HM, HA, KIT.

Kerfoot 4711.

5. **Vicia benghalensis** *L.*

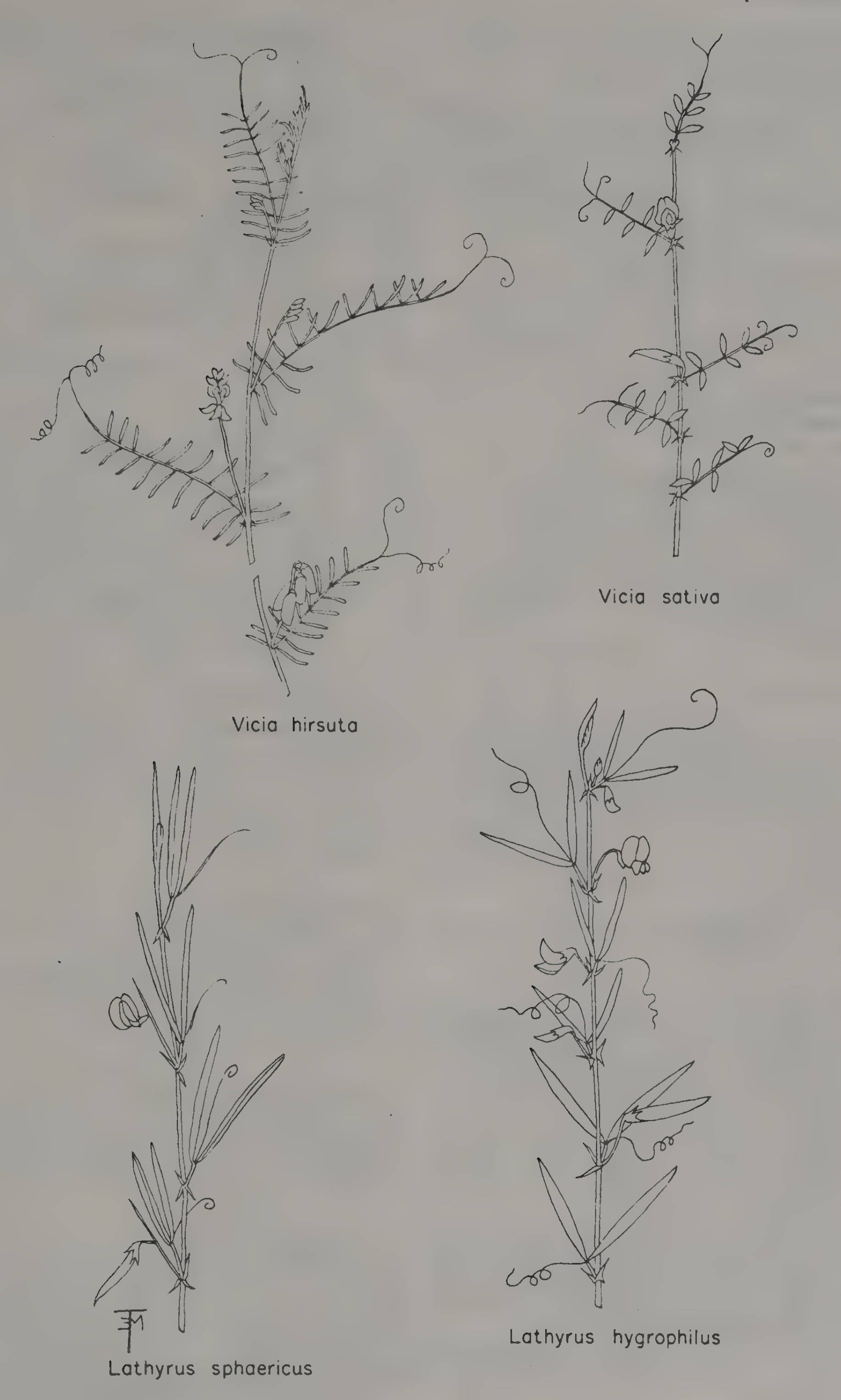
A pubescent climber with 7–12 pairs of elliptic leaflets to each leaf and axillary racemes of purplish flowers.

An escape from cultivation in upland grassland. HM, HA.

Bogdan 5015.

51. LATHYRUS *L.*

Annual or perennial herbs with equal-pinnate leaves, usually terminating in a tendril; leaflets 1-few pairs, mostly parallel-veined; stipels absent; flowers solitary or in axillary racemes, bracts small; bracteoles absent; calyx ± equally 5-lobed; stamens (10) or (9) + 1; anthers uniform; ovary few- to many-ovuled; style incurved, often flat and widened


Vicia hirsuta
Vicia sativa
Lathyrus sphaericus
Lathyrus hygrophilus

terminally and mostly bearded on the inner side; stigma capitate; pod linear-oblong, cylindrical or compressed; seeds globose or angular.

1 Racemes 1-flowered, the rachis prolonged beyond the flower as a bristle
1. *L. sphaericus*
Racemes usually 2-flowered, the rachis not prolonged in a bristle 2. *L. hygrophilus*

1. Lathyrus sphaericus *Retz.* (see p. 317)

A glabrescent rhizomatous herb with a few ascending stems and one pair of linear leaflets on each tendrillar leaf; flower solitary, pedunculate, red or pink.

Uncommon plant found in western Kenya in upland grassland. HE, HM.

Tweedie 2050.

2. Lathyrus hygrophilus *Taub.* (see p. 317)

A trailing climber very similar to *L. sphaericus* but with more elliptic leaves and white, cream or very pale blue flowers.

Locally common, in swampy grassland. HC, HT, HA, HK, KIT, KIS.

Napier 710.

58. MORACEAE†

Trees, shrubs or herbs with opposite or alternate, stipulate leaves and with a milky juice; flowers sessile, in spikes or heads, unisexual; male flowers with 1-4 perianth segments and stamens; female flowers with 2-4 perianth segments, and a superior ovary; stigmas 1-2; ovules 1, pendulous; fruit dry or thinly fleshy but often held within a fleshy perianth or receptacle.

All Kenya genera are trees except the one following.

1. DORSTENIA *L.*

Herbs with alternate or opposite stipulate leaves and axillary flat capitula of unisexual flowers; male flowers with a 2-3-lobed perianth and 1-3 stamens; female flowers in deep pits in the receptacle, the ovary completely buried with a single lateral stigma projecting through the 2-lobed perianth; fruit a 1-seeded drupe or achene, ejected from or retained within the receptacle.

1 Leaves borne at intervals along the stem 2
Leaves in a dense terminal tuft or in a rosette or plants leafless at time of flowering 7
2 Receptacle toothed at margins, the teeth over 8 in number and all ± equal
3. *D. brownii*
Receptacle with horns, with or without teeth between them 3
3 Receptacle with only 2 horns 4
Receptacle with 3 or more horns 5
4 Margin of receptacle entire
1. *D. scaphigera*
Margin of receptacle dentate
2. *D. afromontana*
5 Receptacle triangular with 3-4 major horns and smaller teeth between them 6
Receptacle orbicular in outline with 5 or more major filamentous horns
4. *D. denticulata*
6 Leaves dentate; fertile part of receptacle over 1 cm in diameter when ripe
5. *D. zanzibarica*
Leaves crenate or entire; fertile part of receptacle under 1 cm in diameter when ripe
6. *D. schlechteri*
7 Leaves ovate to orbicular, often appearing after the receptacles; stem buried, tuberous
7. *D. barnimiana*
Leaves lanceolate to narrow-elliptic, appearing with the receptacles; stems at ground level or above, fleshy 8. *D. foetida*

1. Dorstenia scaphigera *Bur.*

A trailing, ascending, ± scabrid herb or weak shrub with ovate to oblanceolate, entire or coarsely toothed and often variegated leaves.

Rare plant found in riverine forest and recently found at Thika. HK, MAC.

Faden 66242.

2. Dorstenia afromontana *R. E. Fr.*

Similar to *D. scaphigera* but weaker and with ovate leaves.

Only known from wet forests on the Aberdares at 7000 ft. HA.

R. and Th. Fries 1434.

3. Dorstenia brownii *Rendle*

A pubescent ascending herb with elliptic, entire or crenate leaves and small pubescent heads.

Recently discovered in Kakamega forest. MUM.

Faden 69980.

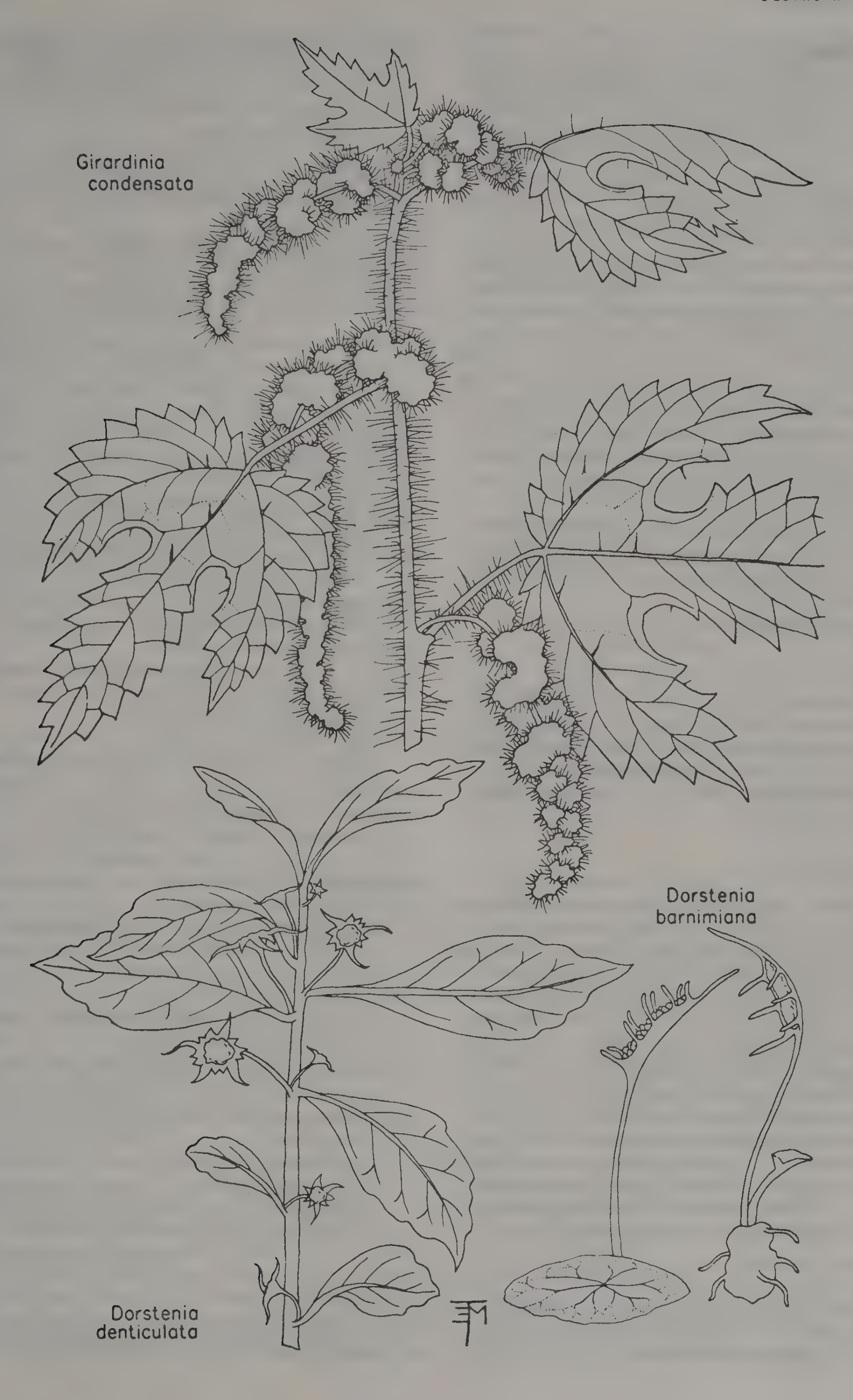
4. Dorstenia denticulata *Peter* (see p. 319)

An erect or ascending, glabrous or pubescent herb with obovate to elliptic, dentate leaves; receptacles pedunculate, with a fringe of long processes.

Our commonest *Dorstenia* found in riverine forest in many areas. HC, HT, NAR, MAC, NBI.

Drummond and Hemsley 1227; Napier 1915.

† By A. D. Q. Agnew.



Girardinia condensata
Dorstenia barnimiana
Dorstenia denticulata

5. Dorstenia zanzibarica *Oliv.*

A trailing pubescent herb with ascending stems and elliptic, weakly dentate leaves; receptacles triangular, on short peduncles.

Recorded only from forest in the Chyulu Hills. KAJ.

van Someren 377.

6. Dorstenia schlechteri *Engl.*

A glabrous or minutely pubescent herb with ovate-elliptic leaves and small heads bearing 3–4 horns.

Another recently discovered species of Kakamega forest. MUM.

Faden 692110.

7. Dorstenia barnimiana *Schweinf.* (see p. 319)

A small herb from an underground tuber, with ovate or orbicular, often peltate, leaves; receptacles elongated, with 3 major processes, and often with minor teeth between them.

Locally common in stony upland grassland. Plants from western Kenya have peltate leaves, but those from the Ngong Hills never do. HE, HC, HT, HA, KIT, MUM, MAC.

Napier 6264; Symes 627.

8. Dorstenia foetida (*Forsk.*) *Schweinf.*

An erect glabrescent herb with a thick fleshy stem bearing crowded leaf scars and a terminal rosette of linear to oblanceolate leaves; receptacles pedunculate, orbicular with *c.* 5 long processes.

Rare plant found in dry rocky grassland. MAC.

Verdcourt 3880.

59. URTICACEAE

Mostly herbs (some trees) with well-developed phloem fibres and coarse, often stinging, hairs; leaves usually simple, stipulate; flowers usually in cymes, unisexual (rarely bisexual), without petals; male flower with similar stamen number to the fused or free sepal lobes; female flower with 1–4 sepals, sometimes sheathing the ovary; ovary with a single stigma and one basal ovule.

A well-defined small family, with one tree, *Obetia pinnatifida* Baker in Kenya. Most have crystalline inclusions in their leaves called cystoliths, which may be rod-shaped or spherical, and appear linear or punctate superficially. Useful fibres are obtained from the phloem, and the leaves are frequently used as a vegetable.

1 Leaves alternate — 2
  Leaves opposite — 11
2 Inflorescences sessile; flowers crowded at nodes — 3
  Inflorescences pedunculate — 7
3 Leaves asymmetric, held in one plane opposite each other at alternate nodes — 7. *Elatostema orientale*
  Leaves usually symmetric, spirally arranged all around the stem — 4
4 Perennial plant with woody stems, often trailing — 9. *Pouzolzia parasitica*
  Annuals or short-lived perennials without woody stems — 5
5 Leaves serrate, stipulate; plant trailing or upright — 6
  Leaves entire, without stipules; plant trailing — 10. *Parietaria debilis*
6 Leaves acuminate; flowers subsessile, not held within a bract — 12. *Australina acuminata*
  Leaves acute, hardly acuminate; flowers sessile, held within a tubular sheathing bract — 11. *Droguetia debilis*
7 Woody shrubs or climbers with no stinging hairs — 8
  Herbs, occasionally becoming woody at base, mostly with stinging hairs — 9
8 Forest climber (sometimes also trailing over rocks) with a paniculate, loose inflorescence — 2. *Urera*
  Forest shrub with flowers in a long interrupted spike of clusters — 8. *Boehmeria platyphylla*
9 Leaves lobed and/or bullate — 5. *Girardinia*
  Leaves entire, surface smooth — 10
10 Cystoliths linear, usually lying along the nerves; female flowers on simple, unwinged pedicels — 4. *Fleurya*
  Cystoliths dot-like, between the nerves; female flowers on winged pedicels — 3. *Laportea alatipes*
11 Plant with stinging hairs — 1. *Urtica massaica*
  Plant without stinging hairs — 12
12 Flowers in pedunculate inflorescences or clustered at nodes; male flowers with 4 stamens and sepals — 13
  Flowers always clustered at nodes; male flowers with 1 stamen and tubular, simple perianth — 14
13 Flowers in separate, distant clusters along an unbranched spike — 8. *Boehmeria platyphylla*
  Flowers in sessile clusters, or in one pedunculate cluster — 6. *Pilea*
14 Inflorescence of small heads, held in undivided involucres — 11. *Droguetia iners*
  Inflorescence of pedicellate flowers, not in a head, not surrounded by an involucre — 12. *Australina flaccida*

1. URTICA *L.*

Erect herbs with opposite simple leaves and stinging hairs; stipules free or connate; flowers mono-

ecious or dioecious in spikes, racemes or panicles; male flower with 4 sepals and stamens; female flower with 4 unequal sepals; achene compressed, enclosed by the two largest sepals.

Urtica massaica *Mildbr.* (see p. 322)

A dioecious erect herb to 2 m, with ovate leaves; inflorescence of axillary groups of spike-like unbranched racemes.

A very irritating plant, often growing in abandoned tracks in the montane forest areas, and particularly associated, in the author's opinion, with the presence of buffaloes. HE, HM, HA, HK, HN, KIT, RV.

Agnew 7265; Mwangangi 74.

2. URERA *Gaud.*

Woody dioecious climbers or shrubs, often (not ours) with stinging hairs, and with alternate, simple, stipulate leaves; flowers in loose cymose panicles; male flower with 4–5 sepals and petals; female flowers with 2 large and 2 small sepals, becoming red and fleshy in fruit, and flattened ovary with a short capitate pubescent stigma.

1 Leaves with 4–6 lateral nerves on each side of the midrib, frequently hairy
 1. *U. hypselodendra*
 Leaves with not more than 3 lateral nerves on each side of the midrib, glabrous
 2. *U. cameroonensis*

1. Urera hypselodendra *Wedd.* (see p. 322)

Heavy woody climber (or trailing over rocks) with ovate to elliptic serrate, pubescent, acuminate leaves with 4–6 major nerves on each side of the midrib; fruits becoming bright red-orange.

Conspicuous when in fruit, this abundant climber is seldom noticed, but is to be found in all wetter montane forest. HE, HM, HA, HK, KIT, MAC, KAJ.

Kerfoot 4691; Agnew 8153.

2. Urera cameroonensis *Wedd.*

Similar to *U. hypselodendra* except for the glabrous leaves which have the basal pair of lateral nerves dominant.

In western Kenya forest, but not, apparently, Kakamega forest. MUM.

Birch 61/201.

3. LAPORTEA *Gaud.*

Erect perennial stinging herbs with alternate, simple leaves and punctate cystoliths; stipules united; flowers monoecious (in ours) or dioecious, in branching, ultimately cymose inflorescences; male flower with 4–5 sepals and stamens; female flower with 4 unequal sepals; achene compressed.

Laportea alatipes *Hook. f.*

Erect herbs with stinging hairs and broad ovate leaves; inflorescences much branched, often exceeding the leaves, the lower male, the upper female; female flowers suspended from horizontal, broadly green-winged pedicels.

Common in disturbed ground in wet montane forest. HM, HA, HK, MUM, KIS, MAC, KAJ.

Lind, Agnew, and Beecher 5481; Kerfoot 3883.

4. FLEURYA *Gaud.*

Annual herbs with or without stinging hairs; cystoliths linear; leaves alternate, simple, with fused stipules; flowers monoecious, in pedunculate panicles or interrupted spikes or cymes; male flower with 4–5 fused sepals and stamens; female flower with 4 sepals; achene compressed.

1 Inflorescence filiform, spike-like, unbranched with glomeruli at intervals
 1. *F. interrupta*
 Inflorescence branched or the flowers in 1–2 masses 2
2 Inflorescence bisexual, branching
 2. *F. aestuans*
 Inflorescence unisexual, the flowers usually condensed into masses 3. *F. ovalifolia*

1. Fleurya interrupta *Gaud.*

Erect annual with orbicular-ovate acuminate leaves; inflorescences long, filiform, exceeding the leaves, with glomeruli at intervals.

Rare, and only found once, in Nyeri district, in our area. HA.

Kibui K53.

2. Fleurya aestuans (*L.*) *Miq.*

Erect annual without stinging hairs, and with ovate to suborbicular leaves; inflorescences much branched, often exceeding the leaves.

Rare plant found in lowland eastern Kenya in *Commiphora* woodland after good rains. KAJ.

Agnew 9884.

3. Fleurya ovalifolia (*Schum.*) *Dandy*

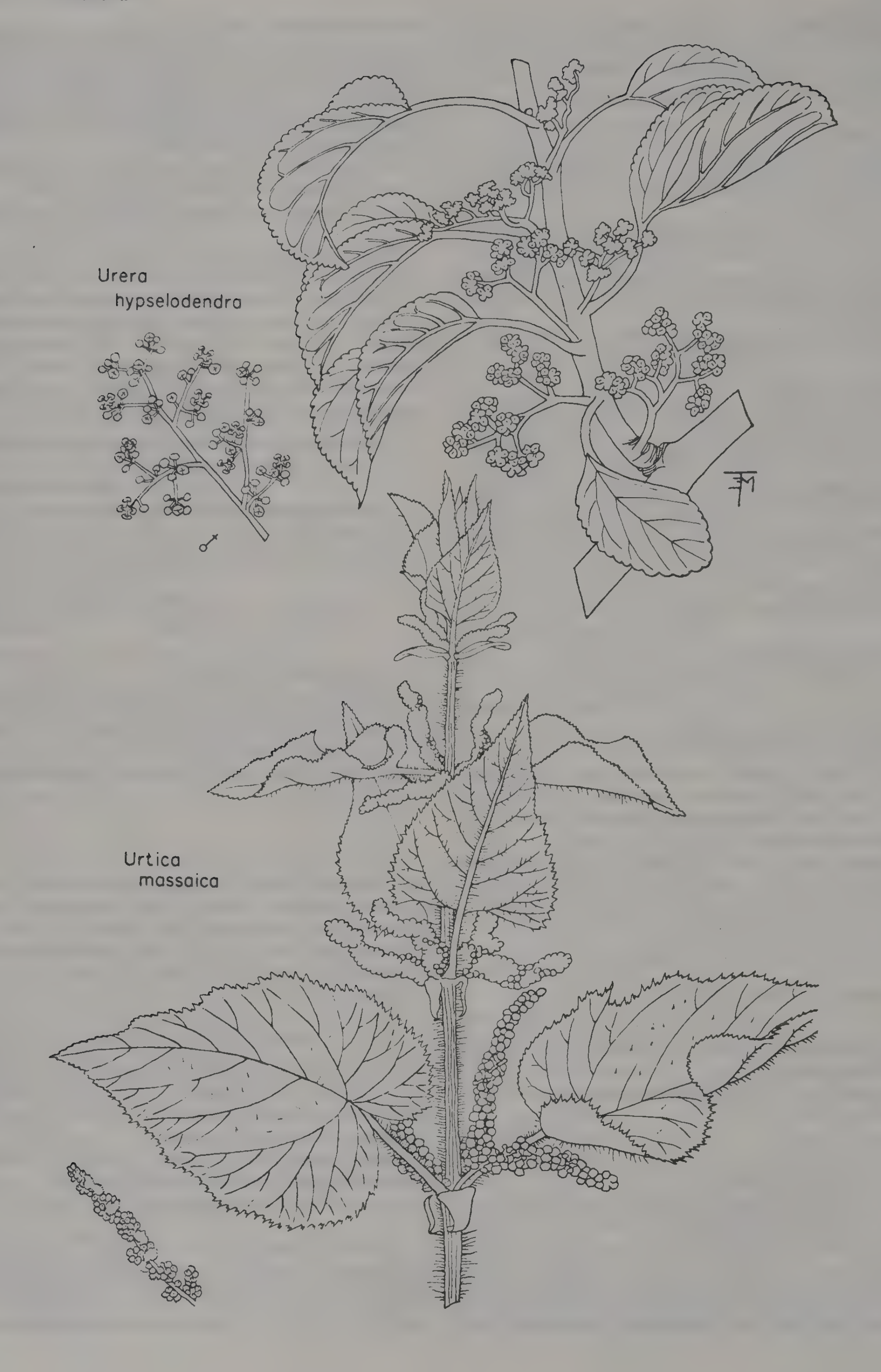
An erect, weakly stinging herb with broadly ovate leaves; male inflorescences with flowers crowded into masses, rarely branched; female inflorescences above the male, branched.

Uncommon plant found in western Kenya, rarer in the east. HK, MUM, KIS, MAC.

Jarrett MAK/5; Agnew and Musumba 8557.

5. GIRARDINIA *Gaud.*

Erect herbs, densely covered with large stinging hairs, and with alternate leaves; stipules connate, caducous; flowers dioecious or monoecious in


Urera
hypselodendra
Urtica
massaica

dense spike-like inflorescences; male flower with 4–5 sepals and stamens; female flower with a perianth in 2 parts, the posterior part large and enclosing the ovary, the anterior filamentous; achenes compressed.

1 Leaves shallowly acutely lobed (twice dentate) with bullate surface — 1. *G. bullosa*
Leaves deeply lobed and denticulate, with a smooth surface — 2. *G. condensata*

1. Girardinia bullosa *Wedd.*

A tall, single-stemmed, stinging herb to 2·5 m with large suborbicular leaves; inflorescences to 10 cm long, axillary, often unisexual.

Occasionally found in streamside marshes in wet montane forest. HA, HK.

Agnew 8778; Mathenge 212.

2. Girardinia condensata *Wedd.* (see p. 319)

Similar to the last species but much smaller (seldom more than 75 cm tall) and with deeply lobed leaves.

The commonest stinging-nettle in many places in the wet forest zone, growing in disturbed places and pathsides. HE, HA, HK, RV, KAJ.

Glover 3708; Agnew 7692.

6. PILEA *Lindl.*

Herbs without stinging hairs, often with fleshy stems, with simple, opposite leaves; stipules fused, intrapetiolarly; flowers monoecious or dioecious, often in globose heads; male flower with 3–4 sepals and stamens, the sepals horned; female flower with 3 sepals; achene compressed.

1 Stipules broad, scarious, blunt, persistent — 3
Stipules obsolete, not scarious, or caducous — 2
2 Leaves elliptic, with a cuneate base — 1. *P. usambarensis*
Leaves ovate, with a rounded base — 2. *P. veronicifolia*
3 Inflorescences all held at the level of the terminal leaf rosette — 3. *P. tetraphylla*
Inflorescences below the terminal leaf rosette — 4
4 Inflorescences pedunculate, globose — 4. *P. johnstonii*
Inflorescences sessile, often forming an apparent whorl round the nodes — 5. *P. ceratomera*

1. Pilea usambarensis *Engl.*

Herb with erect fleshy stems from prostrate older stems, with elliptic leaves and pedunculate heads of flowers; peduncles longer than petioles.

Uncommon plants found in clearings in montane rain forest and bamboo. HA.

Agnew 7164.

2. Pilea veronicifolia *Engl.*

Similar to *P. usambarensis* but with ovate leaves, mostly rounded at base.

Common on the forest floor of wet montane forest in the Aberdares and on Mt. Kenya. HA, HK.

Kabuye 80; Agnew and Faden 9982.

3. Pilea tetraphylla *Blume*

A small erect annual with almost triangular leaves, the inflorescences lying within the terminal rosette, horizontally orientated.

Uncommon plant found in montane forest pathsides and riversides. HA, HK, KIT.

Agnew and Coe 8784; Archer 112.

4. Pilea johnstonii *Oliv.* (see p. 324)

Herb with erect fleshy stems from prostrate older ones, and ovate, acuminate, coarsely serrate leaves; stipules broad, brown, scarious; inflorescences of 1–several globose clusters on long, simple or few-branched peduncles.

The commonest *Pilea* in Kenya, occurring particularly by disturbed streamsides in forest. HE, HC, HT, HM, HA, HK, MUM, KAJ.

Tweedie 66/202; Napier 3152.

5. Pilea ceratomera *Wedd.*

Similar to *P. johnstonii* but often smaller and occasionally decumbent, and with sessile clusters of flowers, without a common peduncle, at the nodes.

Uncommon plant found in montane forest streamsides and pathsides. HC, HT, HM, HA, HK, KAJ.

Irwin 378A; Agnew 9004.

7. ELATOSTEMA *Forst*

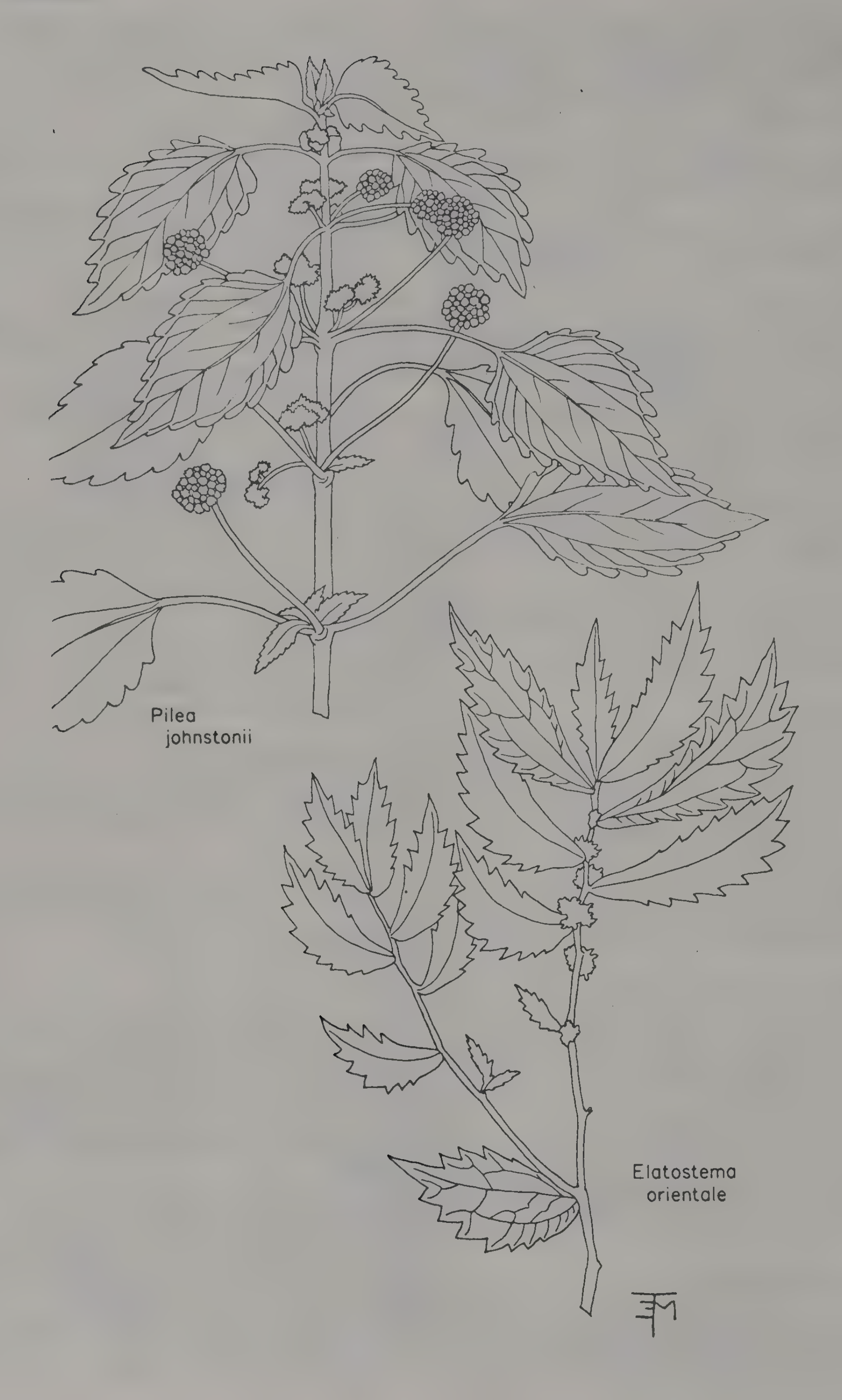
Herbs with linear cystoliths; leaves simple, opposite or alternate by the abortion of one of an unequal pair (as in ours); flowers held in dense bracteate heads, monoecious or dioecious; male flowers with 4–5 sepals and stamens; female flowers with 3–5 perianth segments, not adhering in fruit.

Elatostema orientale *Engl.* (see p. 324)

Herb with erect stems of limited growth from a perennial stolon; leaves very asymmetric, in two rows, alternate; flower heads sessile.

A common plant of dark, wet places in wet forest. HC, HM, HA, HK.

Agnew 8178; Kerfoot 3899.


Pilea
johnstonii
Elatostema
orientale

8. BOEHMERIA *Jacq.*

Trees or shrubs with opposite or (in ours) alternate, simple leaves with free stipules; flowers monoecious or dioecious, in globose clusters; male flower with 3-5 sepals (joined at base) and stamens; female flower with a tubular, 2-4-toothed calyx, persistent and enclosing, sometimes adhering to, the fruit.

Boehmeria platyphylla *Don*

Woody herb or shrub with alternate ovate acuminate leaves; flowers in globose clusters on long, slender, unbranched racemes.

Rare plant found in Kakamega forest. MUM.

Dale 3112; Tweedie 69/30.

9. POUZOLZIA *Gaud.*

Herbs or shrubs with alternate leaves, separate stipules, and no stinging hairs; flowers monoecious, clustered in leaf axils; male flowers with 3-5 sepals and stamens; female flower with a tubular perianth which envelops the ripe fruit.

Pouzolzia parasitica (*Forsk.*) *Schweinf.*

A weak trailing shrub with ovate-elliptic leaves; fruit 3-angled, shiny.

Uncommon plant found at the edges of and on rocky areas within dry upland forest. HM, HA, HK, MUM, KIS, MAC, NBI, KAJ.

Agnew and Hanid 8797; Verdcourt 956.

10. PARIETARIA *L.*

Weak herbs with alternate, entire, exstipulate leaves; flowers crowded in axillary cymes, bisexual and unisexual together; bisexual flowers with 4 sepals, 4 stamens and free ovary; unisexual flowers similar but either without stamens or without a functional ovary.

Parietaria debilis *Forsk.*

Annual trailing herb with suborbicular, thin, membranous leaves and very small axillary clusters of flowers.

Rare plant found in disturbed places at the upper forest limits. HE, HA, HK.

Agnew 8879; Hedberg 1964.

11. DROGUETIA *Gaud.*

Herbs with alternate or opposite leaves with free stipules; flowers monoecious, clustered at the nodes in bowl-shaped or cylindrical, toothed involucres; male flower with tubular, 3-lobed calyx and 1 stamen; female flower with no perianth.

1	Leaves alternate	1. *D. debilis*
	Leaves opposite	2. *D. iners*

1. **Droguetia debilis** *Rendle*

Trailing herb with ascending stems and alternate, ovate-elliptic leaves; involucre ± tubular.

Not uncommon on the floor of highland forest. HE, HM, HA, HK, MAC, KAJ.

Verdcourt 1151; Tweedie 66/278.

2. **Droguetia iners** (*Forsk.*) *Schweinf.*

Trailing or herbaceous plant (sometimes climbing) with opposite, ovate, subacuminate leaves; involucre usually bowl-shaped.

Often recognizable when sterile by the reddish-chestnut stipules, this plant is fairly common in highland forest, especially near the lower limit of the bamboo. HE, HM, HA, KIS.

Agnew 7111; Glover, Gwynne, and Samuel 1163.

12. AUSTRALINA *Gaud.*

Herbs, usually creeping, with alternate or opposite simple leaves and free stipules; flowers monoecious, clustered in leaf axils, without an involucre; male flower with apparently 1 acute sepal, tubular below enclosing the single stamen; female flower with a sac-like perianth; fruit compressed.

1	Leaves alternate	1. *A. acuminata*
	Leaves opposite	2. *A. flaccida*

1. **Australina acuminata** *Wedd.*

Annual herb with alternate, ovate acuminate leaves and clusters of flowers at the nodes.

Apparently rare plant found in disturbed places in upland forest. HT, HA.

Agnew 9672 A; Verdcourt and Polhill 3161.

2. **Australina flaccida** *Wedd.*

Trailing annual very similar to *A. acuminata* except for the opposite leaves without an acumen.

Rare, but probably overlooked, found by streamsides in highland forest. HE, HA.

Agnew 8286; Tweedie 2677.

60. CELASTRACEAE†

Trees, shrubs, or climbers without tendrils, with or without latex; leaves alternate or opposite, simple; stipules inconspicuous; inflorescence cymose or clustered; flowers bisexual, regular; calyx 4-5-lobed, imbricate or valvate; petals usually 5, imbricate or valvate; stamens 3-5, inserted on or below the disc margin; anthers 1-2-celled; ovary superior mostly 3-locular; style short, lobed; seeds few or many, with aril.

† By A. D. Q. Agnew and S. Kibe.

1. HIPPOCRATEA *L.*

Small trees, shrubs or climbers, without latex, climbing by means of twining lateral branches; leaves opposite or subopposite, glabrous; stipules free or ± united interpetiolarly; inflorescence a panicle or cyme, axillary; disc extra-staminal; stamens 3, anthers versatile; carpels 3, fruit of 3 capsular mericarps; seeds winged.

1 Peduncle and pedicel glabrous; flower-buds cylindrical or globular — 2
  Peduncle and pedicel puberulous; flower-buds conical — 2. *H. africana*
2 Flower-buds cylindrical, leaf apex obtuse — 1. *H. goetzei*
  Flower-buds globular, leaf apex acuminate — 3. *H. indica*

1. Hippocratea goetzei *Loes.*

A woody liane, with elliptic or ovate leaves, and with whitish lenticels which become ± elongated and protuberant; disc cylindrically elongated, united with androgynophore apically; anthers 1-celled; seeds broadly winged.

Occasionally found as a robust climber in upland forest. HM, HA.

Kerfoot 4899; Agnew, Hanid, and Kiniaruh 7916.

2. Hippocratea africana (*Willd.*) *Loes.*

A woody liane with glabrous, brown, lenticellate stem; leaves elliptic-oblong to ovate, apex rounded or obtusely acuminate; bracts pubescent; pedicel and calyx pubescent; anthers 2-celled.

Found in riverine forests. HE, HM, HA, NAR, NBI.

Newbould 7405; Agnew 7243.

3. Hippocratea indica *Wild.*

A woody liane without stem lenticels; leaves big (4–12 x 3–7 cm), elliptic to obovate; inflorescence lax; flower-buds globose; ovary surrounded by the disc.

Found in moist evergreen forests. HM, HK, NAR.

Glover, Gwynne, and Samuel 226.

61. ICACINACEAE†

Trees or shrubs, sometimes climbing; leaves simple, alternate rarely opposite, stipules absent; inflorescence axillary or terminal; flowers bisexual or unisexual by abortion, regular; calyx small, 4–5-lobed, valvate or imbricate; petals 4–5; stamens same number and alternate with petals; anthers 2-celled; ovary superior, 1-celled; style simple or stigma sessile; fruit drupaceous or a samara, 1-seeded.

1. PYRENACANTHA *Wight*

Climbing shrubs; leaves alternate, petiolate; inflorescence spike-like or racemose; flowers unisexual by abortion; calyx absent; petals valvate, persistent on fruit; vestigial ovary in male flower; vestigial staminode in female flower; fruit a broadly ovoid drupe.

Pyrenacantha malvifolia *Engl.*

Straggling or climbing, ± pubescent perennial shrub with a tuberous rhizome from which the shoots spring; stem with papery, thin, light green bark; leaves suborbicular, cordate, crenate; inflorescence a woolly catkin; fruit pubescent, ovally compressed.

Occasionally found in *Acacia-Commiphora* scrub on sandy or rocky soil. RV, MAG.

Glover and Cooper 3484; Verdcourt 3717 (S).

62. LORANTHACEAE‡

Parasitic shrubs with green photosynthetic, opposite or alternate, entire exstipulate leaves; flowers bisexual or unisexual, regular or zygomorphic; calyx reduced to a tube or rim or obsolete; petals 4–5, valvate in bud; stamens as many as, and opposite to the petals; ovary inferior, the ovules indistinct and the seeds without a clear testa.

All the mistletoes fall in this family. In the following account much material has not been seen and the names and distributions are only tentative.

1 Flowers unisexual, regular; corolla under 5 mm long, with inconspicuous triangular lobes — 2. *Viscum*
  Flowers bisexual, often zygomorphic; corolla over 1 cm long, showy, ligulate — 1. *Loranthus*

1. LORANTHUS *L.*

Shrubby parasites growing on branches of trees and shrubs with opposite or alternate, green leaves; flowers bisexual, in cymes, umbels or racemes; calyx tubular or represented by a rim; petals 4–5, free or fused, usually zygomorphic; stamens as many as petals, opposite to the petals and fused to them; style and stigma simple; fruit a berry.

In the following account the old, broad definition of this genus is followed since no comprehensive treatment exists for the group in our area, and it has been found impossible to assign our species

† By A. D. Q. Agnew.

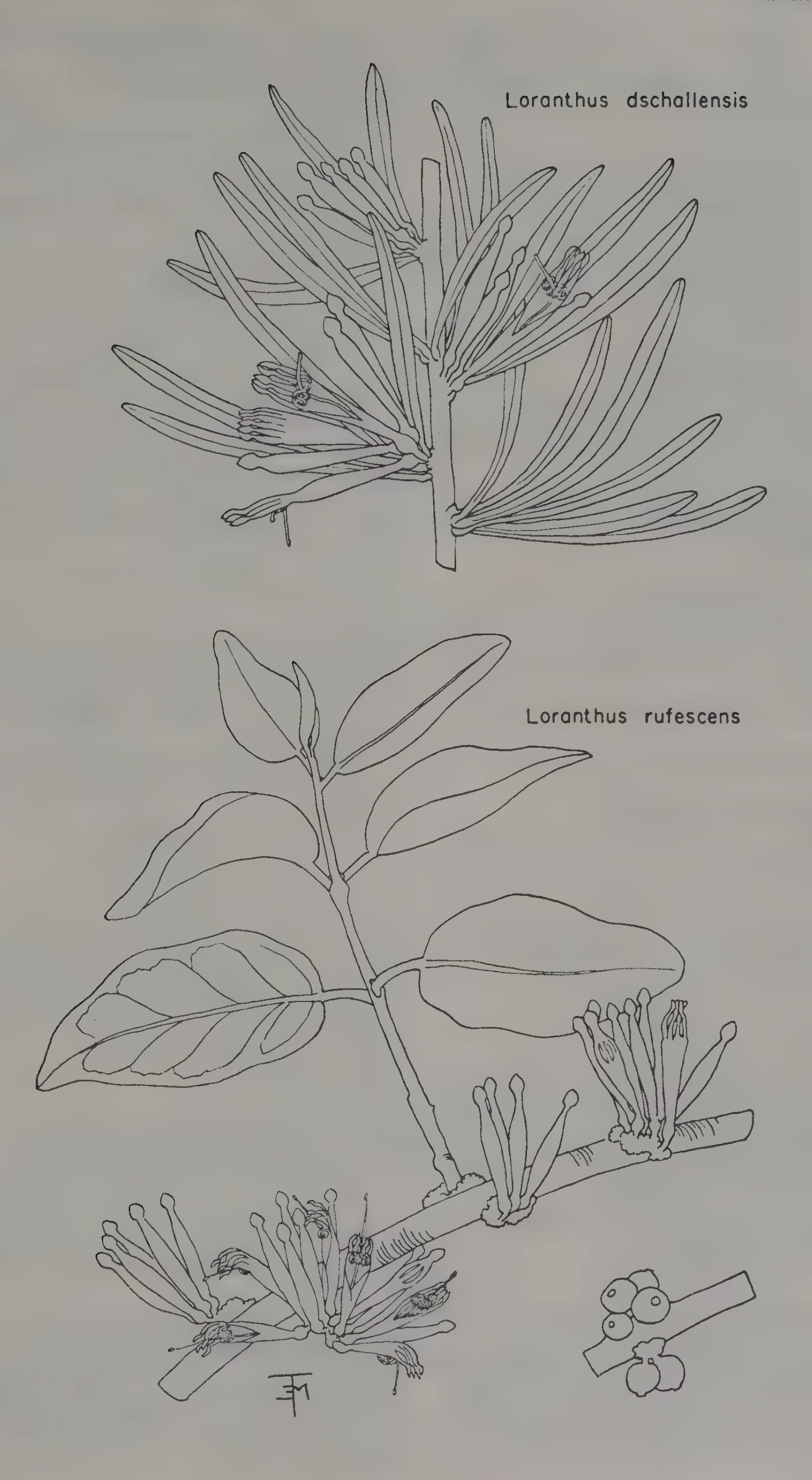
‡ By A. D. Q. Agnew.



Viscum tuberculatum
Loranthus fischeri
Viscum schimperi

to segregate genera as defined for other regions of Africa.

1 Flowers in terminal racemes 1. *L. kirkii*
Flowers in umbels or fasciculate, usually not terminal 2
2 Petals hairy on the outside 3
Petals glabrous on the outside 8
3 Corolla lobes much longer than tube 4
Corolla splitting only at the top, the lobes much shorter than the tube (which may be split down one side only) 6
4 Bract with a long linear process at one side, exceeding the calyx 2. *L. hildebrandtii*
Bract truncate, not exceeding the calyx 5
5 Calyx long-tubular; stamens breaking in two shortly after anthesis 3. *L. ulugurense*
Calyx rim-like; stamens with persistent anthers 4. *L. heckmannianus*
6 Flower bud densely reddish-tomentose, with a spherical apical swelling; anthers transversely divided into small chambers 7
Flower bud minutely pubescent, with a cylindrical, 5-angled apical portion; anthers not transversely divided 5. *L. aurantiacus*
7 Leaves ovate/elliptic, mostly rounded at base 6. *L. rufescens*
Leaves oblong, linear to oblanceolate, cuneate at base 7. *L. dschallensis*
8 Petals fused at least at base 9
Petals free to base 8. *L. curviflorus*
9 Filaments coiled at anthesis 11
Filaments straight or gently curved at anthesis 10
10 Leaves crisped at margin; corolla tube straight 9. *L. panganensis*
Leaves entire at margin; corolla tube curved 10. *L. acaciae*
11 Corolla lobes separating from each other only in the central portion, with a tube, split at one side, above and below it 11. *L. platyphyllus*
Corolla lobes separating from each other or loosely coherent only at the apex 12
12 Corolla tube black within, grey outside with a red tip 16. *L. woodfordioides*
Corolla tube not black within, except for a black spot sometimes at the filament insertion 13
13 Corolla lobes longer than corolla tube (including that part of the corolla tube which may be split at one side) 14
Corolla lobes shorter than corolla tube (including that part of the tube which may be split at one side) 20
14 Sepal tube longer than its diameter 15
Sepal tube rim-like or shorter than its diameter 18
15 Bract pubescent 12. *L. fischeri*
Bract glabrous 16
16 Corolla tube yellow-green; leaves glaucous when young 13. *L. ugogensis*
Corolla tube red at apex; leaves not glaucous 17
17 Corolla tube in bud showing 5 indentations and protuberances marking the positions of filament insertion; leaves obovate 14. *L. acacietorum*
Corolla tube in bud smooth, without showing indentations and protuberances; leaves linear to oblanceolate 15. *L. stuhlmannii*
18 Young stems densely pubescent-tomentose; corolla with a black spot at the insertion of each filament within 17. *L.* sp. *B*
Young stems glabrous or glabrescent; corolla unmarked within 19
19 Corolla lobes 5, loosely coherent at the apex; corolla tube bulbous at base, split for less than half its length 18. *L. sulphureus*
Corolla lobes 4, free at apex; corolla tube cylindrical at base, split for more than half its length 19. *L.* sp. *C*
20 Corolla lobes coiled or bent back at anthesis 21
Corolla lobes erect at anthesis 23
21 Anthers short, bifid at apex, not toothed at base; petal lobes coiled 20. *L. braunii*
Anthers long, entire at apex, toothed at base; petal lobes reflexed but not coiled
22 Buds blunt; petals straight but reflexed 21. *L. constrictiflorus*
Buds acute; petals variously contort and reflexed 22. *L. meridianum*
23 Petal lobes with abruptly demarcated, thickened yellowish shield on inner side of apical lobe; bud 5-ridged at tip 5. *L. aurantiacus*
Petal lobes without thickened apex, or thickened and gradually weakening below; bud cylindrical to tip 24
24 Young twigs densely pubescent to tomentose 23. *L. ziziphifolius*
Young twigs glabrous 25
25 Corolla tube cylindrical throughout 24. *L.* sp. *D*
Inflated bulb present at base of corolla tube 26
26 Sepal tube not split at anthesis by swelling of basal bulb of corolla tube; filament with no apical tooth 25. *L. brunneus*
Sepal tube split at anthesis by swelling of basal bulb of corolla tube; filament with a small apical tooth 27


Loranthus dschallensis
Loranthus rufescens

27 Leaves oblanceolate to oblong-elliptic, cuneate at base 26. *L. oehleri*
Leaves ovate to ovate-elliptic, rounded or obtuse at base 27. *L. keudelii*

1. Loranthus kirkii *Oliv.*

Plant glabrous with ovate to broad elliptic penninerved leaves; racemes many-flowered; flowers orange, about 12 mm long.

Uncommon plant found in dry country and at the coast. MAG, MAC.

Lind 5577; EAH 6.

2. Loranthus hildebrandtii *Engl.*

Plant pubescent with ± elliptic, penninerved leaves; flowers fascicled, with an orange or purple pubescent corolla, split down one side and only partially split into separate lobes.

Uncommon plant found in dry country, especially by riversides. EMB, MAC.

Archer 462.

3. Loranthus ulugurense *Engl.* (see p. 335)

Plant stellate-pubescent on all parts with broad ovate ± cordate leaves; petals silky-hairy, greenish with orange tube.

Common in dry bushland. HM, HA, NAR, RV, MAC, NBI.

Glover 2490; Agnew 5043.

4. Loranthus heckmannianus *Engl.*

Plant tomentose with mostly opposite, ovate leaves; flowers fasciculate, yellow-green and orange very hairy outside; filaments toothed at apex.

Uncommon plant found in evergreen dry woodland and *Combretum* savannah. NAR, RV, MAC.

Archer 217; Glover 3904.

5. Loranthus aurantiacus *Engl.*

Plant glabrescent or sparsely pubescent with opposite or alternate lanceolate-elliptic leaves; leaves with 3–5 major veins from near the base; flowers shortly umbellate, orange, yellow and red, with abruptly demarcated hard pads under the petal lobes, and with toothed filaments.

Rare plant found at the coast and inland in *Commiphora* bushland. EMB.

Archer 518.

6. Loranthus rufescens *DC.* (see p. 329)

Plant stellate-tomentose, especially on the young parts, with large ovate-elliptic, penninerved leaves; flowers covered with reddish hairs, the corolla lobes only free apically; anthers chambered transversely.

Common in highland savannah. HC, HT, HM, HA, HK, KIT, MUM, NAR, MAC.

Agnew 9016; Glover 604.

7. Loranthus dschallensis *Engl.* (see p. 329)

Similar to *L. rufescens* but with oblong to linear leaves, tapering gradually at the base.

Combretum country and drier bushland. BAR, NAN, MAC.

Tweedie 67/353.

8. Loranthus curviflorus *Benth.* (Inc. *L. sagittifolius* Sprague) (see p. 331)

Plant glabrous, creeping over the surface of its host by means of root-like rhizomes; leaves variable, suborbicular to oblong, cuneate to sagittate, rarely both on the same plant; flowers in umbels; petals yellow and red, curved from the base, free.

Common on *Acacia* trees in dry bushland, grassland, and highland savannah. HT, BAR, RV, MAG, NAN, MAC, KAJ.

Strid 2695; MacKinnon 2.

9. Loranthus panganensis *Engl.* (see p. 333)

Plant glabrous with alternate, very fleshy, crisped leaves; flowers subsessile, pink, grey-green and dark red with 5 prominent ridges below the curved lobes and stamens.

Rather uncommon plant found in dry rocky bushland usually on *Commiphora.* NAR, EMB, MAC, KAJ.

Agnew 8746; Archer 465.

10. Loranthus acaciae *Zucc.*

Plant glabrous, creeping over surface of host by root-like rhizomes; leaves obovate, alternate, thick; flowers pink and green, straight or slightly curved, with reflexed green petal lobes at anthesis.

Rare plant found in dry country, especially on *Acacia* and *Commiphora.* MAG.

Archer 494.

11. Loranthus platyphyllus *A. Rich.*

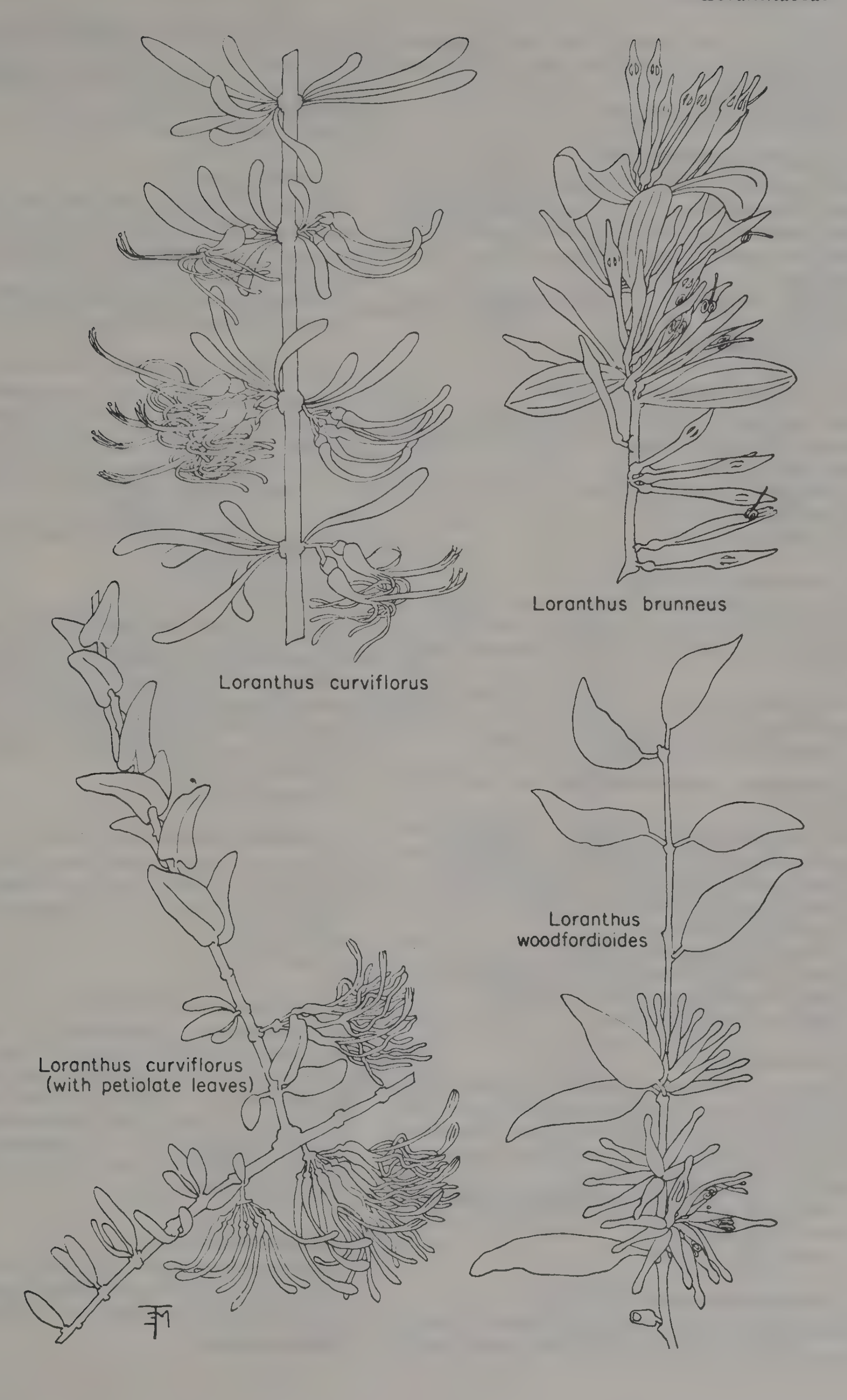
Plant glabrous, glaucous with alternate lanceolate or rhomboid leaves; flowers umbellate, pink and orange, with the petals fused to their tips.

Rare plant found in the northern part of our area and in need of further collection. BAR.

Archer 497.

12. Loranthus fischeri *Engl.* (see p. 327)

Plant finely pubescent when young, with small alternate elliptic to oblanceolate leaves; flower with pubescent bract and yellow, much contorted petals and stamens.


Loranthus brunneus
Loranthus curviflorus
Loranthus woodfordioides
Loranthus curviflorus (with petiolate leaves)

Common in dry upland forest and evergreen bushland. HC, HT, HA, NAR, BAR, RV, EMB, MAC, NBI, KAJ.
Agnew 9055; Nattrass 937.

13. Loranthus ugogensis *Engl.*
Plant glabrous, with lanceolate-elliptic leaves; flowers in fascicles of 2–3, yellow-green, with much contorted petals and stamens and with 5 pubescent protuberances inside the base of the petal tube.
Locally common in dry *Acacia* bushland. BAR, MAG, MAC, KAJ.
Agnew 9086; Archer 509.

14. Loranthus acacietorum *Bullock*
Plant glabrous, with alternate oblanceolate leaves; flowers red and orange, with much contorted petals and stamens.
Rare plant found in dry country and in need of further collection. MAC.
Archer 215.

15. Loranthus stuhlmannii *Engl.*
Plant finely pubescent, with narrow, linear to oblanceolate leaves; flowers 1–3 in each fascicle, yellow and red, with a simple, cylindrical corolla tube.
Rare plant found in dry country, only found once by Lake Victoria in western Kenya. MUM.
Agnew, Musumba, and Kiniaruh 8044.

16. Loranthus woodfordioides *Schweinf.* (see p. 331)
Plant glabrous with alternate or opposite, penninerved, linear to broad-lanceolate leaves; flowers in dense pedicellate fascicles, grey below, red at tip and with black interior; petals 4 or 5, not reflexed; filaments toothed at apex.
Common in montane rain forest on a wide variety of hosts including many introduced trees. HC, HT, HM, HK, KIS, NAR, MAC, NBI.
Harmsen 6555; Glover 458.

17. Loranthus *sp.* **B.**
Pubescent or tomentose herb with opposite, small blunt broad-ovate leaves; flowers small, in axillary umbels, grey flushed pink above but rather dull; petals 4, with a spot at each filament insertion; filament with a tooth at apex.
Rare plant found in dry bushland in western Kenya. MUM, NAR.
Agnew 8051; Glover 317.

18. Loranthus sulphureus *Engl.*
Plant glabrous, with elliptical to obovate, 3-nerved leaves; flowers 3–5 in each fascicled group, yellow with red tip; petals 5, remaining erect, not contort at anthesis.
Uncommon plant found in dry upland forest. HM, HA, NAR, RV, NBI.
Agnew 8951; Archer 272.

19. Loranthus *sp.* **C.**
Plant sparsely pubescent with ovate, subopposite, penninerved leaves; flowers in small pedicellate fascicles, yellow; petals 4, not reflexed; filaments toothed.
Rare plant found in dry bushland. HT, MAC.
Ossent, February 1962; Nattrass 452.

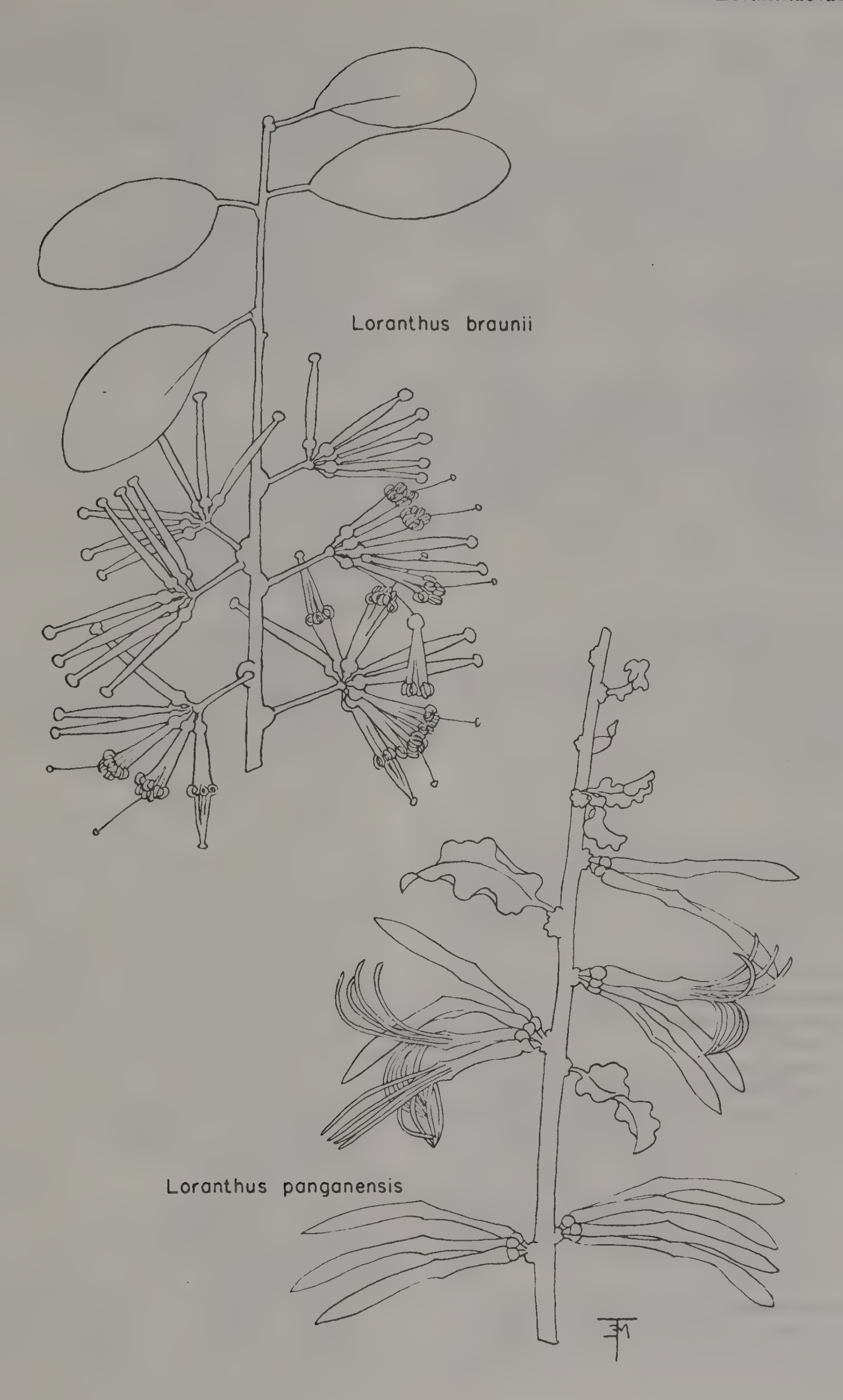
20. Loranthus braunii *Engl.* (see p. 333)
Glabrous plant with blunt oblanceolate to elliptical leaves; flowers in pedunculate umbels; corolla pink with green-purple knob at end, red within, the tube with swelling at base and (in bud) at apex, lobes coiling back; anthers short, bifid at apex.
Rare plant found in wet savannah of western Kenya. MUM, KIT.
Archer 240.

21. Loranthus constrictiflorus *Engl.* (see p. 335)
Plant glabrous with subopposite, lanceolate, penninerved leaves; flowers in subsessile umbels, reddish-orange; corolla tube with basal bulb, lobes reflexed; filaments toothed at apex.
Uncommon plant found in western Kenya. KIT, MUM.
Archer 237; Dekker 46.

22. Loranthus meridianum *Danser*
Glabrous with suborbicular leaves; flowers shortly pedicellate, red with a green tip in bud.
Rare plant found in dry bushland on *Acacia mellifera.* BAR.
Tweedie 2974.

23. Loranthus ziziphifolius *Engl.*
Plant pubescent or tomentose, except on the flower and old leaves; leaves oblanceolate, 3-nerved; flowers in subsessile clusters, pink or crimson with bands of green and scarlet; corolla with a bulb at base and erect lobes; filaments entire.
Fairly common in dry (*Combretum*) bushland, especially near Nairobi. HA, RV, EMB, MAC.
Greenway 11180; Agnew 9388.

24. Loranthus *sp.* **D.**
Plant glabrous with ovate-elliptic, 3-nerved, opposite leaves; flowers in subsessile clusters, pink; corolla with no basal bulb and with erect lobes; filaments entire.


Loranthus braunii
Loranthus panganensis

Only once found and apparently to be looked for in Endau, in MAC.
Archer 264.

25. Loranthus brunneus *Engl.* (see p. 331)

Plant glabrous with broad-elliptic, 3-nerved, subopposite leaves; flowes in sessile clusters, yellow-orange with a green band and a red tip; corolla with a basal bulb and apically erect lobes; filaments entire.
Rare plant found in upland forest. HA, HK.
Hanid and Kiniaruh 962; Howard and Verdcourt 3784.

26. Loranthus oehleri *Engl.*

Plant glabrous with alternate, oblanceolate to obovate leaves; flowers in sessile clusters, red and orange; corolla with a basal bulb and erect lobes; filaments toothed.
Rare plant found in dry *Commiphora* bushland. MAG, MAC.
Lind and Agnew 5638; Archer 508.

27. Loranthus keudelii *Engl.*

Similar to *L. oehleri* but with a heavily lenticelled stem, broad-ovate or ovate-elliptic leaves and a shorter flower (*c.* 3 cm compared with *c.* 4 cm).
Rare plant found in riverine forest at lower altitudes. EMB, MAC.
Hanid and Kiniaruh 1032; Faden 66188.

2. VISCUM *L.*

Parasites with opposite green leaves and cymose inflorescences; flowers monoecious or dioecious, regular; calyx obsolete or absent; petals usually 4, with short valvate lobes and a very short tube; fruit a 1–3-seeded berry.

1 Plants with expanded leaves — 2
Plants with scale-leaves only — 1. *V. schimperi*
2 Flowers clustered at nodes, sessile; fruit warty — 2. *V. tuberculatum*
Flowers sessile in pedunculate 2–7-flowered heads at the nodes; fruit smooth — 3
3 Leaves crisped at margin; disc at apex of fruit of the same size as in the flower and frequently retaining the persistent petals — 3. *V. nervosum*
Leaves entire, hardly undulate at margin; disc at apex of fruit enlarged and rim-like, retaining no trace of petals — 4. *V. fischeri*

1. Viscum schimperi *Engl.* (see p. 327)

Plant glabrous, pendulous or erect, with almost sessile flowers and fruit; fruit smooth or slightly warted.
On *Acacia* species, especially in the dry uplands. Most plants collected are female; the male may be a smaller plant to be found on *Juniperus procera.* HM, HK, MUM, MAC, NBI.
Strid 2632B (♂); Agnew 9248 (♀); Faden 66167 (♀).

2. Viscum tuberculatum *A. Rich.* (see p. 327)

Plant glabrous, erect or pendulous, with usually yellowish, obovate to oblanceolate leaves; flowers in ± sessile clusters; fruit tuberculate.
The most widespread mistletoe in Kenya, found in all upland dry woodland. HE, HT, HM, MUM, KIS, NAR, RV, NAN.
Glover 2216A; Tweedie 66/310.

3. Viscum nervosum *A. Rich.*

Plant glabrous, pendulous, with broad- or narrow-elliptic leaves with crisped edges; flowers 1–3 together on short peduncles; fruit smooth, often with persistent perianth.
Uncommon plant, except around Nairobi. HT, NAR, NBI.
Kerfoot 4055; Agnew 8492.

4. Viscum fischeri *Engl.*

Similar to *V. nervosum* except for the oblanceolate to obovate leaves with smooth edges, the longer peduncles (5–7 mm) bearing 4–7 flowers, and the expanded rim at the fruit apex.
Only found in forest near Nairobi. NBI.
Johnstone 63; Harmsen 6553.

63. SANTALACEAE R. Br.†

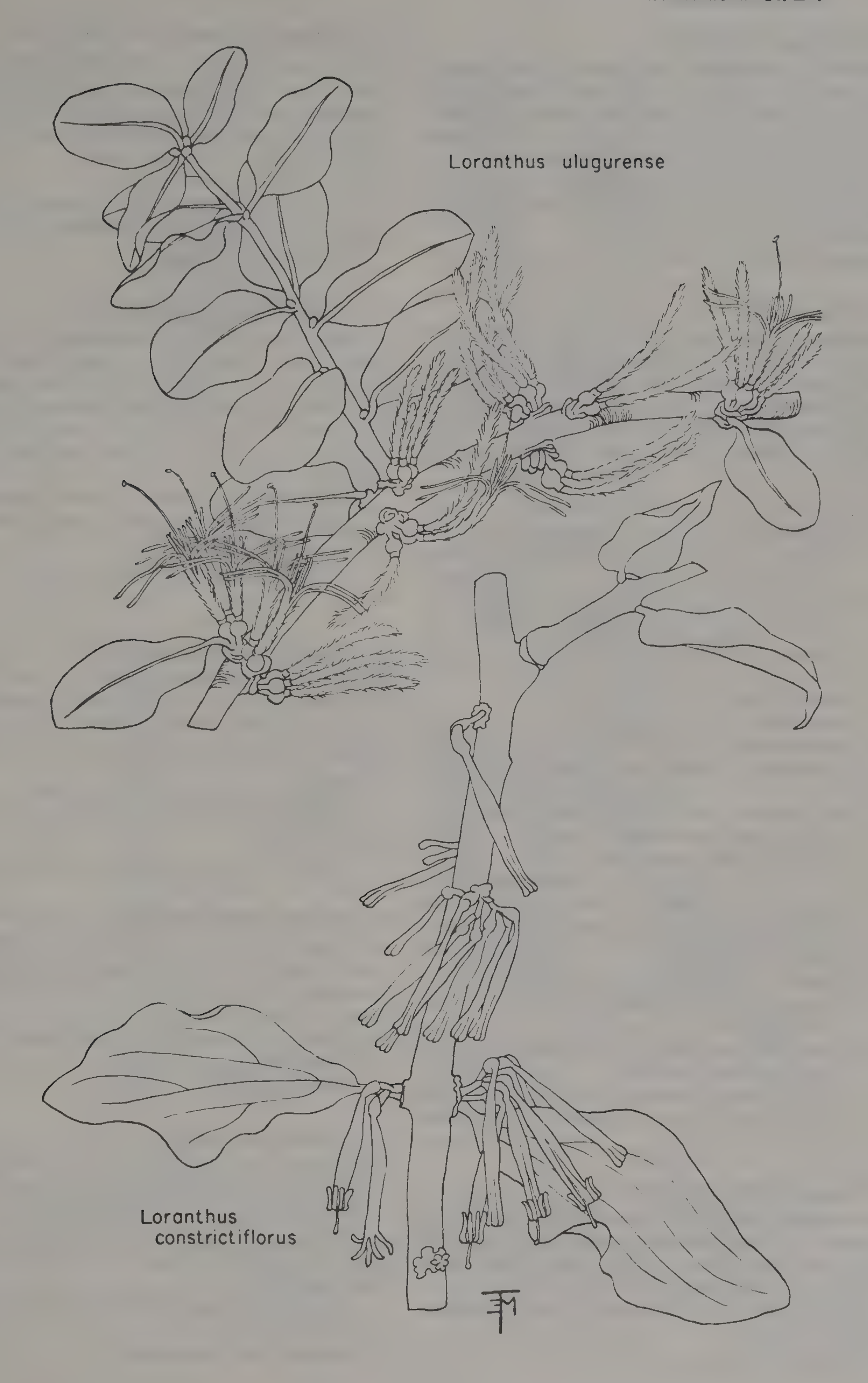
Trees, shrubs, or herbs, often semi-parasitic; stem ridged; leaves simple, entire, alternate, exstipulate; inflorescence axillary or terminal, perianth in one whorl (sepals), fleshy, often produced above the ovary as a tube, 3–6-lobed, yellow or greenish; stamens the same number as perianth lobes, inserted at or below lobe bases; ovary inferior, one celled, with 1–3 free central ovules; fruit indehiscent, dry or fleshy.

1. Semi-parasitic herbs; leaves linear, filiform or reduced to scales — 2. *Thesium*
Shrub; leaves elliptic to oblanceolate, shortly petiolate — 1. *Osyridicarpos*

1. OSYRIDICARPOS *A. DC.*

Non-tendrillate scandent shrub; stem ridged; leaves alternate, simple 1·2–2 cm; flowers in terminal racemes or axillary; bracteoles minute; perianth persistent, adnate to the inferior ovary, tubular; stamens 5; anthers ovoid; fruit a 2–3-seeded drupe.

† By A. D. Q. Agnew and S. Kibe.


Loranthus ulugurense
Loranthus constrictiflorus

Osyridicarpos scandens *Engl.*

Scandent or straggling undershrub; stem ridged, with rod-like branches, pubescent towards the apex; leaves elliptic to lanceolate; perianth lobes a quarter the length of tube; flowers solitary, axillary, yellowish-green; pedicels pubescent.

Usually found on rocky ground in dry evergreen bushland and dry forest. HC, HM, HA, HK, NAR, RV, NAN, MAC, NBI.

Agnew 8494; Elliot 2383.

2. THESIUM *L.*

Herbaceous plants with woody rootstock, semiparasitic through root contact, stem wiry; leaves small, usually filiform or broad-linear, alternate, entire; inflorescence racemose; flowers bisexual; bracts often adnate to pedicel; sepals 5, valvate, often hairy within, yellow; fruit 1-seeded, indehiscent.

1 Leaves scale-like, up to 1 cm long — 2
  Leaves filiform or linear, over 1 cm long — 3
2 Flowers crowded, sessile, in lateral spikes; sepal lobes linear — 1. *T. stuhlmanii*
  Flowers 1–3 together usually at apex of a long lateral filiform peduncle, over 1 cm long; sepal lobes oblong, hairy — 2. *T. unyikense*
3 Leaves terete — 4
  Leaves flat — 5
4 Inflorescence 6–10-flowered, well defined, terminal, raceme-like; sepals hairy within — 3. *T. schweinfurthii*
  Inflorescence up to 7-flowered, poorly defined, not raceme-like, without a terminal flower; sepals glabrous — 4. *T. kilimandscharica*
5 Flowers sessile along lower portion of the long ± unbranched, erect stems; sepal lobes linear — 5. *T. ussanguense*
  Flowers pedicellate and pedunculate in branched, well defined inflorescence; sepal lobes oblong — 6
6 Fruits dry, reticulate, borne high on plant at apex of most shoots — 6. *T.* sp. *A*
  Fruits fleshy, borne low on plant, and exceeded in height by sterile, leafy shoots — 7. *T.* sp. *B*

1. Thesium stuhlmanii *Engl.*

Erect woody annual with leaves reduced to ovate-lanceolate acute scales; flowers sessile, crowded on short compact axillary spikes; sepal-lobes linear, twice as long as the tube.

Occasionally found in grazed or burnt bushland. KIS, RV, MAC.

Archer 545; Kokwaro 1870.

2. Thesium unyikense *Engl.* (see p. 337)

A low wiry herb with flowers solitary or 1–3 together in long-pedunculate lateral groups; peduncle over 1 cm long, filiform, subtended by scale-leaves and with the floral bracts and bracteoles acting as an involucre to the terminal flower; sepal-lobes oblong.

Found only once, in burnt upland grassland at Kitale. In need of further collection. KIT.

Tweedie 68/9.

3. Thesium schweinfurthii *Engl.*

Perennial herb with numerous erect spreading stems (much branched above); leaves flat and tending to be filiform; inflorescence short, 6–10-flowered, well defined, terminal, raceme-like; sepal lobes triangular, with an apical tuft of hairs within, longer than the tube and the short (0·5 mm long) style.

Usually found in burnt upland grassland after rain and (rarely) in forests amongst Kikuyu grass. HA, RV, NAN, EMB, KAJ.

Kabuye 8; Agnew, Kiniaruh, Ngethe, and Wyatt 8913.

4. Thesium kilimandscharica *Engl.*

Similar to *T. schweinfurthii* except in having the inflorescence up to 7-flowered, poorly-defined, not raceme-like, without a terminal flower, sepals glabrous within and hardly fused below, the lobes triangular.

Occasionally found in burnt upland grassland and on shallow rocky soils in *Philippia* woodland. HA, RV, NAN.

Polhill 231; Agnew, Hedberg, and Mmari 9616.

5. Thesium ussanguense *Engl.* (see p. 337)

An erect wiry herb with flat, subulate leaves; flowers sessile along the long, ± scapose spike-like branches; bracts up to 5 mm long; sepal-lobes linear, hairy within.

Found only once, in burnt upland grassland after rain. KIT.

Tweedie 68/12.

6. Thesium *sp.* **A.** (see p. 337)

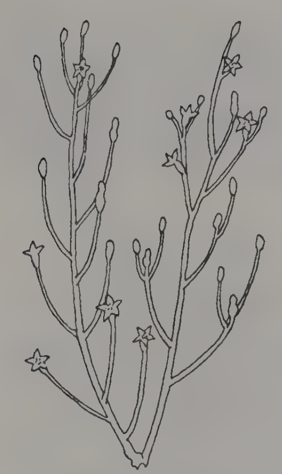
An erect wiry herb with flat, subulate leaves; flowers pedicellate and pedunculate in poorly-defined inflorescences; sepals with a tuft of hairs at the apex of each lobe within, the tube longer than the lobes; style nearly 1 mm long, longer than the sepal tube.

Found in the same habitats as the other species. KIT, NAR, RV.

Kabuye 8B; Tweedie 68/11.



Thesium sp. A



Thesium unyikense

Thesium ussanguense

Helinus mystacinus

7. Thesium *sp.* B.

Perennial herb with spreading stems, branched above; leaves flat; inflorescence overtopped by sterile leafy shoots; flowers pedicellate and pedunculate in poorly defined inflorescences; sepals with a tuft of hairs at the apex; fruit fleshy, turning red.

Found in open grassland. HA, HT, HM, KIT, RV.

Harvey 186.

64. BALANOPHORACEAE L.†

Fleshy annual or perennial herbs parasitic on roots of other plants, without chlorophyll or stomata; stem a thin rhizome or tuberous mass; leaves reduced to scales or absent; inflorescence arising from the ground as a paniculate spike or head with scale leaves, unisexual; petals absent; stamens 1–5; stigma sessile; ovary 1–3-locular, adnate to perianth when present; ovules solitary in each loculus; fruit small, nut- or drupe-like, 1-seeded.

1 Inflorescence branched, often massive and fleshy with obscure bracts — 1. *Sarcophyte piriei*
Inflorescence consisting of a solitary head subtended by numerous imbricate bracts on a short peduncle — 2. *Thonningia sanguinea*

1. SARCOPHYTE *Sparrm.*

Fleshy parasites with branched unisexual inflorescences; male flowers with 3-valved calyx and one stamen; female flowers with naked ovary.

Sarcophyte piriei *Hutch.*

Fleshy tuberous dioecious plant coloured deep crimson except for the pale bracts; male inflorescence up to 40 cm tall; female inflorescence up to 25 cm or in globular masses at ground level.

Occasionally found parasitizing *Acacia* and *Newtonia* in riverine forests. Smells fruity. HM, MAC, NBI.

Greenway 9833; Beecher 5875.

2. THONNINGIA *Vahl*

Parasites with thin rhizomes and erect, solitary heads of unisexual flowers surrounded by an involucre of acute bracts; flowers unisexual; male flowers with 3–5 sepals and 3–5 united stamens; female flowers with 2–4-lobed perianth and a 1-celled inferior ovary; fruiting head fleshy.

† By A. D. Q. Agnew.

Thonningia sanguinea *Vahl*

Herb with erect, sessile or pedunculate heads subtended by thick, numerous, imbricate, acute, reddish scales; heads unisexual.

Only found once in Kakamega forest. MUM.
Dale 3383.

65. RHAMNACEAE‡

Mostly trees or shrubs often climbing by hooks (*Ventilago*), tendrils (*Helinus, Gouania*), or twining; leaves always simple, usually stipulate, alternate or opposite; inflorescence cymose; flowers small hermaphrodite, calyx tubular, 4–5-lobed, lobes valvate; petals 4–5, opposite to and half enclosing the stamens; intrastaminal disc usually present; ovary superior or sunk in the torus (perigynous); carpels 2–4; ovules axile, 1–2 in each loculus, fruit various, often drupaceous, occasionally with wings.

1 Leaves serrate — 2
Leaves entire — 4
2 Flowers in paniculate axillary inflorescences; plant with tendrils — 3
Flowers solitary, axillary; plant without tendrils — 1. *Rhamnus prinoides*
3 Leaves pubescent on lower surface with reddish hairs on the veins; inflorescence a spike — 2. *Gouania*
Leaves glabrous on both surfaces, inflorescences cymose — 4. *Ventilago*
4 Plant with tendrils — 3. *Helinus*
Plant without tendrils — 5. *Scutia myrtina*

1. RHAMNUS *L.*

Rhamnus prinoides *L'Hérit.*

Sometimes a woody climber. Dealt with in KTS. p. 391.

2. GOUANIA *Jacq.*

Tendrillate climbing shrubs or lianes; leaves alternate petiolate, entire, or dentate; inflorescence of panicles of spikes; sepals 5; petals 5; ovary inferior; fruit 3-winged, schizocarpic.

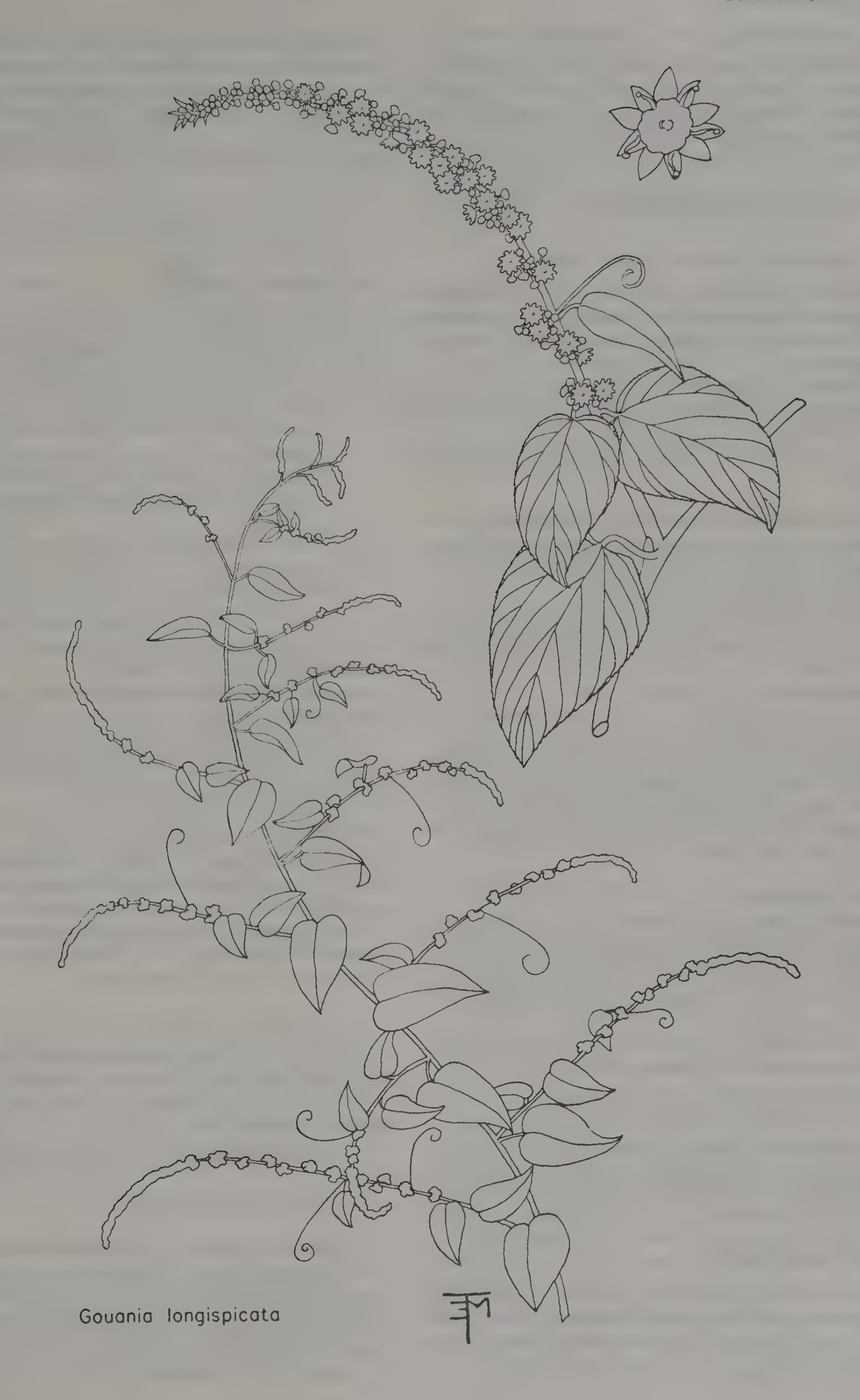
Gouania longispicata *Engl.* (see p. 339)

Climber, often woody, with tendrils on the inflorescence branches only; leaves simple, ovate, serrulate, apex acuminate, reddish-hairy on the veins below.

Found growing in riverine forests in the upland area. HA, HK, KIT, MUM, KIS.

Agnew 8739; Heriz-Smith and Paulo 883.

‡ By A. D. Q. Agnew and S. Kibe.



Gouania longispicata

3. HELINUS *Endl.*

Tendrillate shrubs or climbers; leaves alternate, petiolate, entire; inflorescence a 1–several-flowered pedunculate axillary umbel; petals small; ovary inferior, with 3 locules; fruit dry or schizocarpic.

1 Pedicel and fruit glabrous 1. *H. integrifolius*
Pedicel and fruit hairy 2. *H. mystacinus*

1. Helinus integrifolius (*Lam.*) *Kuntze*

Perennial climbing shrubs; leaves ovate to broadly obovate, base subcordate, upper surface glabrous and lower one puberulous; pedicel and fruit glabrous.

Found in disturbed dry bushland and in *Commiphora* woodland. HA, HK, RV, MAG, MAC, KAJ.

Agnew 9796; Glover, Gwynne, and Samuel 2927.

2. Helinus mystacinus (*Ait.*) *E. Mey.* (see p. 337)

Similar to *H. integrifolius* except in having glabrous pedicels and fruit, and with leaves broadly ovate to circular.

Found in scrub, grassland, and evergreen woodland. HE, HC, HM, HL, HA, KIS, NAR, RV, EMB, MAC, NBI, KAJ.

Harmsen 64-19; Faden 67174.

4. VENTILAGO *Gaert.*

Trees or climbers; leaves toothed or entire, alternate; inflorescence of loose panicles; floral parts in fives; petals small; style on green central disc; fruit one-seeded, with oblong wing developed from style after fertilization.

Ventilago africana *Exell*

Glabrous trees or woody lianes; leaves ovate, toothed or entire, petiolate, base truncate; inflorescence tomentose, lateral to leaf axil, loosely paniculate; fruit one-seeded, with long wing developed from the style.

Found in relict forest with *Croton* spp. MUM.

Drummond and Hemsley 4793.

5. SCUTIA (*DC.*) *Brongn.*

Scutia myrtina (*Burm. f.*) *Kurz*

Sometimes a climbing shrub. Dealt with in KTS p. 391.

66. VITACEAE†

Perennial herbs, shrubs or trees, often climbing by means of branched tendrils; leaves alternate, stipulate, often palmate or palmatifid; flower actinomorphic, usually bisexual, parts in fours or sixes; calyx often hardly lobed; corolla free or forming a tube below; stamens as many as the petals and opposite to them; ovary superior, usually 2-locular, with 2 ovules in each; fruit a berry with 1–4 (–8 in *Leea*) seeds; seeds with much endosperm.

The family of the grape which many of our wild climbers resemble. The fruit, however, though edible, is not a delicacy.

1 Leaves compound 2
Leaves simple 5
2 Leaves bipinnate 5. *Leea guineensis*
Leaves palmately 3–7-foliolate 3
3 Petals 4; leaves 3–7-foliolate 4
Petals 5–6; leaves trifoliolate 6. *Rhoicissus*
4 Flower buds spherical; fruit with more than 1 seed 2. *Cayratia*
Flower buds cylindrical, contracted near or above the centre; fruits 1-seeded 4. *Cyphostemma*
5 Flowers subsessile; leaves and stems never succulent 1. *Ampelocissus africana*
Flowers pedicellate, in umbels; leaves and/or stems frequently succulent 3. *Cissus*

1. AMPELOCISSUS *Planch.*

Perennial climbers; tendrils usually arising from the peduncle; leaves simple, entire or lobed or 3-foliolate; inflorescences of condensed cymes with flowers ± sessile in capitate heads; calyx entire or ± lobed; petals 5; seeds 4.

Ampelocissus africana (*Lour.*) *Merr.*

A tendrillar ± hairy climber with simple or palmatifid, sub-orbicular, deeply cordate leaves with rounded apex; flowers almost sessile.

Uncommon plant found in hot country and in western Kenya only. KIT, MUM, BAR.

Napier 2000; Bogdan AB4050.

2. CAYRATIA *Juss.*

Climbing tendrillate perennial herbs, very similar to *Cyphostemma* but with a globose flower bud (the petals broad-elliptic), entire disc, short style and 2–4-seeded fruit.

1 Leaves 5-foliolate, the leaf stalk twice divided 1. *C. gracilis*
Leaves 3-foliolate, palmate 2. *C. ibuensis*

1. Cayratia gracilis (*Guill. & Perr.*) *Suesseng.*

A tendrillate glabrous climber with pedately 5-foliolate leaves; leaflets ovate, serrate.

Uncommon plant found in wet forest areas of western Kenya. KIT, MUM.

Agnew 8551; Bogdan 4221.

† By A. D. Q. Agnew.

2. Cayratia ibuensis (*Hook. f.*) *Suesseng.*

A tendrillate glabrous to glabrescent climber with 3-foliolate leaves; leaflets ovate to elliptic.

Uncommon plant found along the shore of Lake Victoria. MUM, KIS.

Hanid and Kiniaruh 695; Agnew and Musumba 8006.

3. CISSUS *L.*

Herbs or shrubs with or without tendrils; leaves simple (in ours) or palmate, margins variously toothed (rarely entire); inflorescence leaf-opposed or terminal; flowers in umbels; flowers 4-merous, usually conical in bud; calyx entire or 4-lobed; petals hooded at the apex; anthers 4; disc annular, entire or lobed; fruit usually 1-seeded.

1 Stem heavily succulent and quadrangular — 2
  Stem woody or herbaceous, not succulent — 3
2 Wings on the stem undulating — 1. *C. cactiformis*
  Wings on the stem straight — 2. *C. quadrangularis*
3 Leaves fleshy — 4
  Leaves membranous — 5
4 Leaves glabrous; pedicel without glands — 3. *C. rotundifolia*
  Leaves and pedicel with scattered glandular hairs — 4. *C.* sp. *A*
5 Inflorescences on leafless woody stem; leaves rounded or obtuse at apex — 5. *C. aphyllantha*
  Inflorescence on leafy herbaceous stem; leaves acute or acuminate at apex — 6
6 Pedicel hairy in flower, becoming glabrescent in fruit; leaf apex acute or hardly acuminate — 6. *C. petiolata*
  Pedicel glabrous; leaf with a long, ± parallel-sided acumen — 7. *C. oliveri*

1. Cissus cactiformis *Gilg.* (see p. 342)

A fleshy, tendrillate plant with 4 broad green undulate wings to its stem and ± orbicular, ephemeral leaves.

Occasional, on stony soils in dry *Acacia-Commiphora* country. BAR, RV, MAC.

Tweedie 67/3; Bally B9488.

2. Cissus quadrangularis *L.*

Similar to *C. cactiformis* but differs in having straight wings on the stem, and smaller flowers.

Similar in habitat but more common than *C. cactiformis.* HT, NAR, MAG, MAC, NBI, KAJ.

Agnew 8224; Harmsen 8.

3. Cissus rotundifolia (*Forsk.*) *Vahl* (see p. 342)

Climbing tendrillate shrub; stem 4–5-angled, pubescent; leaves fleshy, folded down the midrib where they often split into two, margin toothed.

Common, in dry *Acacia-Commiphora* bushland and on murrum-sand soils. MUM, KIS, NAR, BAR, RV, MAG, MAC.

Agnew, Musumba, and Kiniaruh 7974; Leippert 5258.

4. Cissus *sp.* **A.**

Trailing herb; stems ridged; leaves thickly fleshy, toothed; pedicel with scattered glandular hairs; fruit oval, with an indumentum of glandular hairs.

This species needs further investigation. Found only once 2 miles east of Emali along Nairobi-Mombasa road on grey loamy soil. MAC.

Hanid and Kiniaruh 532.

5. Cissus aphyllantha *Gilg.*

Tendrillate woody climber or shrub up to 1–2 m; tendrils and young branches with reddish hairs.

Locally common in *Commiphora-Euphorbia-Acacia* dry scrubland, on rocky outcrops and red sandy loam. MAC.

Verdcourt 2372.

6. Cissus petiolata *Hook. f.*

Perennial climber with ± quadrangular stem developing longitudinal corky wings when old; leaves ± orbicular, cordate, shortly acuminate.

Found in upland forests. HE, HA, NBI.

Perdue and Kibuwa 8091.

7. Cissus oliveri (*Engl.*) *Gilg*

Perennial climber; similar to *E. petiolata* except for the long-acuminate leaves and glabrous pedicel.

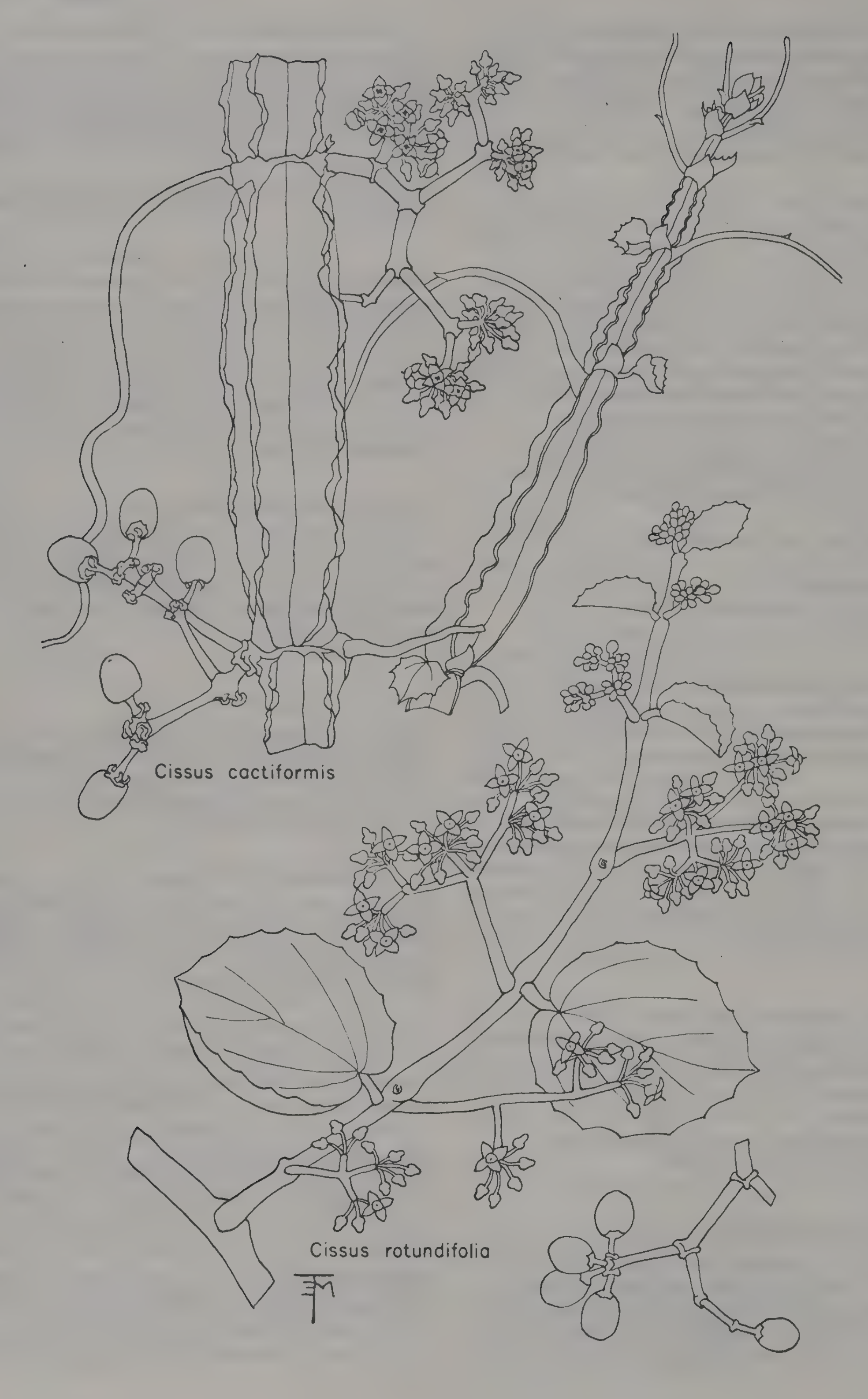
Found in upland forest as a trailer or climber. HA, HN, EMB, MAC.

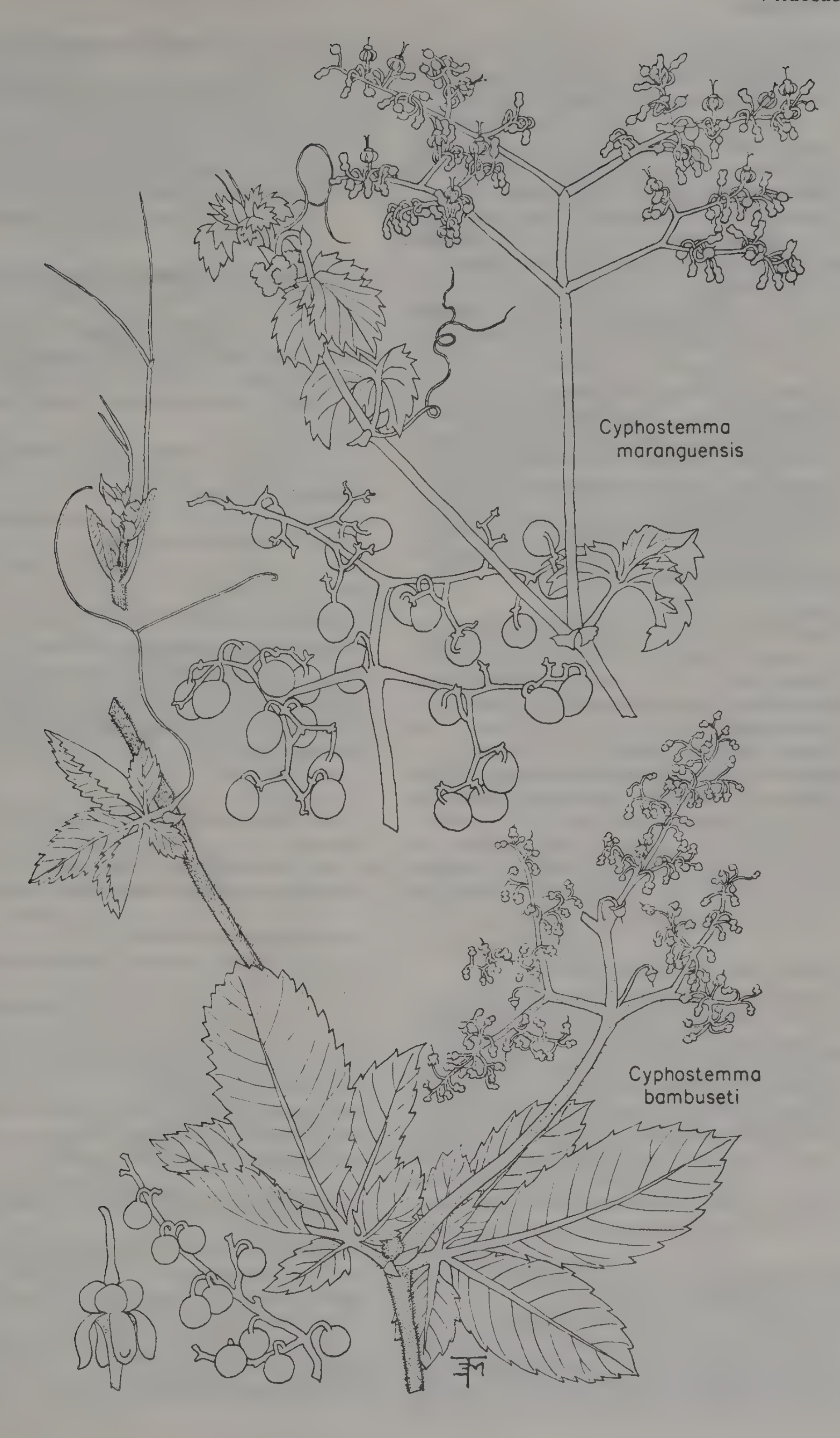
Agnew 9364; Archer 353.

4. CYPHOSTEMMA (*Planch.*) *Alston*

Perennial herbs, shrubs or climbers with or without tendrils opposite the palmately divided leaves; inflorescences of pedunculate corymbose cymes, often of fasciculate cymules; flower buds cylindrical, usually constricted about the middle; calyx often entire; petals 4, very caducous; stamens 4; disc of 4 conical or truncate glands; ovary with 1 ovule and a simple subulate style; seed rugose; fruit a berry.

1 Leaves mostly 3-foliolate and never more than 4-foliolate — 2
  At least some leaves with 5 or more leaflets — 6


Cissus cactiformis
Cissus rotundifolia



Cyphostemma maranguensis
Cyphostemma bambuseti

2 Stipules rounded at apex, glossy brown and glabrescent, sheathing the young leaves at the stem apex; plant never glandular — 1. *C. kilimandscharicum*
Stipules acute at apex, green or light brown, not glossy, usually hairy, not sheathing the stem apex; plant often glandular — 3
3 Leaflets with an acuminate apex and acute, triangular teeth — 2. *C.* sp. *A*
Leaflets with rounded or acute apex and obtuse teeth — 4
4 Leaflets with conspicuously raised, reticulate venation below, the surface appearing as small ± circular pits; upper leaflet surface glossy, glabrous, dark green — 12. *C.* sp. *B*
Leaflets without conspicuous reticulation of raised venation below; upper leaflet surface not glossy, usually pubescent, light green — 5
5 Leaflets orbicular, becoming glabrous; corolla without glands — 13. *C.* sp. *C*
Leaflets usually elliptic, hairy; corolla usually with glands — 14. *C. maranguense*
6 Climbing plants with tendrils — 7
Erect herbs without tendrils — 14
7 The lowermost lateral leaflets borne on a common stalk from the main axis of the leaf — 9. *C. adenocaule*
All leaflets arising from the same point — 8
8 Pedicels glandular — 10
Pedicels without glands — 9
9 Petioles with long, glandular hairs; bracts of cymules of the inflorescence longer than some pedicels, persistent — 10. *C. ukerewense*
Petioles with no long glandular hairs; bracts of cymules of inflorescence shorter than pedicels, caducous — 11. *C. nodiglandulosum*
10 Flower bud and fruit glandular — 11
Flower bud and fruit without glands — 12
11 Leaflets with conspicuously raised, reticulate venation below, the surface appearing as small ± circular pits; upper leaflet surface glossy, glabrous, dark green — 12. *C.* sp. *B*
Leaflets without conspicuous reticulation of raised venation below; upper leaflet surface not glossy or dark green, often pubescent — 6. *C. bambuseti*
12 Usually some or all leaves with more than 5 leaflets; leaflets narrow-elliptic — 7. *C. orondo*
No leaf with more than 5 leaflets; leaflets oblanceolate to obovate — 13
13 Leaflets grey- or white-tomentose below, sparsely pubescent above — 8. *C. lentianum*
Leaflets pubescent not tomentose below, glabrous or pubescent above — 3. *C. nierense*
14 Leaflets obovate, crenate, with ± rounded apex — 4. *C. sp. D*
Leaflets elliptic, serrate, with acute or acuminate apex — 15
15 Flowers buds glandular — 5. *C. heterotrichum*
Flowers buds without glands — 16
16 Leaves sessile, glabrous — 15. *C. jatrophoides*
Leaves petiolate, usually pubescent, rarely glabrous — 7. *C. orondo*

1. Cyphostemma kilimandscharicum (*Gilg*) *Wild & Drum.*

A strong trifoliolate climber with ovate-elliptic leaflets and broad brown sheathing stipules; glands totally absent.

Common in montane rain forest. HC, HM, HA, HK, HN, KAJ.

Agnew 7099; Verdcourt and Polhill 2995.

2. Cyphostemma *sp.* **A.**

A trifoliolate climber with sub-orbicular leaflets, strongly glandular on all parts.

A dry country plant, badly in need of further collecting. KAJ.

Agnew 7338; Gilbert J 8.

3. Cyphostemma nierense (*Th. Fr. jr.*) *Desc.*

Climber with tendrils and 5-foliolate leaves; leaflets orbicular to obovate, finely pubescent to glabrescent, with widely spaced venation; sparsely glandular on pedicels and stem, without glands on flowers and fruit.

A common climber in forest and bushland edges with a wide ecological range from dry *Acacia* bushland to dry upland forest edges. HL, HA, MUM, NAR, RV, EMB, MAC, NBI, KAJ.

Agnew and Kibe 10048; Kokwaro 225.

4. Cyphostemma *sp.* **D.**

An erect herb without tendrils and with 5–7-foliolate, often very large leaves; leaflets obovate, rounded at apex, densely yellow-pubescent below when young; small glands present on pedicels and fruits, absent from stems and leaves and present or absent on flower buds.

Uncommon plant found in dry bushland in the Machakos district. MAC, KAJ.

Mwangangi 8; Verdcourt 2320

5. Cyphostemma heterotrichum (*Gilg & R. E. Fr.*) *Wild & Drum.*

An erect herb without tendrils and with 5–7-foliolate leaves; leaflets ± elliptical, with mixed indumentum of black glands and white hairs; glands present on all parts.

Locally common in the Kitale area in burnt grassland. HC, HE, KIT.

Tweedie 67/37; Bogdan 4263.

6. Cyphostemma bambuseti (*Gilg & Brandt*) *Wild & Drum.* (see p. 343)

A climber with 3–5-foliolate leaves, the leaflets elliptic to oblong with a pale tomentum below; minutely glandular on all parts.

Not uncommon, found at the edges of dry upland forest. HC, HM, HA, KIT, NAR, MAC.

Agnew 9898; Kirrika 498.

7. Cyphostemma orondo (*Gilg & Bened*) *Desc.* (incl. *C. sesquipedale* of Check List) (see p. 346)

Climbing or trailing, rarely erect, from a swollen tuberous tap-root, with or without tendrils; leaflets 3–7, linear-elliptical, densely pubescent below; glands present on all parts except flowers and fruit.

As defined here this is a species of variable habit, frequently without tendrils. It is common in bushed grassland. HT, KIT, MUM, KIS, NAR, BAR, RV, NAN, MAC, KAJ.

Hanid and Kiniaruh 513; Brown 1122.

8. Cyphostemma lentianum (*Volk. & Gilg*) *Desc.*

Climber with tendrils and 5-foliolate leaves; leaflets obovate-elliptic, grey-tomentose below; glandular on all parts except flowers and fruit.

An uncommon *Cyphostemma* found in rocky places in dry bushland, so far only recorded from a small area of the Rift Valley. RV, MAG.

Glover 4132; Agnew 7154.

9. Cyphostemma adenocaule (*A. Rich.*) *Wild & Drum.*

A 5-foliolate climber with a twice-branched axis to the leaf, with suborbicular, usually glabrous leaflets; glands entirely absent.

A common *Cyphostemma* of dry bushland, from the coast to 5000 ft. KIT, MUM, KIS, MAC, KAJ.

Hanid and Kiniaruh 491; Makin 104.

10. Cyphostemma ukerewense (*Gilg*) *Desc.* (Incl. *C. glandulosissima, C. braunii* of Check List)

A 5-foliolate climber with numerous long glandular hairs on stems, petioles, peduncles and flower buds but none on the pedicel or fruit; leaflets obovate, acute at apex.

An uncommon plant found in western Kenya. HE, HC, KIT, MUM.

Napier 1953; Strid 2865.

11. Cyphostemma nodiglandulosum (*Th. Fr. jr.*) *Desc.* (Incl. *C. cyphopetala p.p.* of Check List)

A climber with 3–5-foliolate leaves, the leaflets elliptic, grey- or white-tomentose below; glands present only at the nodes.

A common plant of dry upland, HE, HC, HT, HM, HA, KIT, KIS, NAR, RV, EMB.

Tweedie 67/64; Jack in EAH 3051.

12. Cyphostemma *sp.* **B.**

A trifoliolate climber with elliptic leaflets very prominently reticulate and pubescent below; glands present, but short, on all parts.

Common around Nairobi and in dry bushland and evergreen woodland, especially on shallow, rocky soils. MAC, NBI, KAJ.

Agnew and Hanid 8346; Rogers 2.

13. Cyphostemma *sp.* **C.**

A trifoliolate climber with orbicular, fleshy, smooth leaflets; glands present on pedicels but not on corolla.

This is another dry-country species which has been not been collected very satisfactorily. MAG, KAJ.

Bally 7320; Glover, Gwynne, and Samuel 2799.

14. Cyphostemma maranguense (*Gilg*) *Desc.* (see p. 343)

A trifoliolate climber with broad-elliptic leaflets which are often covered with a yellowish tomentum below; usually glandular on all parts.

As defined here a most variable plant grading from pubescent to tomentose leaflets and sparsely to densely glandular vegetative parts. The fruits, however, are always glandular-hairy. Common in dry upland forest edges, particularly between Nairobi and the Kikuyu escarpment. HA, HK, MAC, KAJ.

Agnew 8729; Verdcourt 1027.

15. Cyphostemma jatrophoides (*Bak.*) *Desc.* (*Vitis jatrophoides* Baker) (see p. 346)

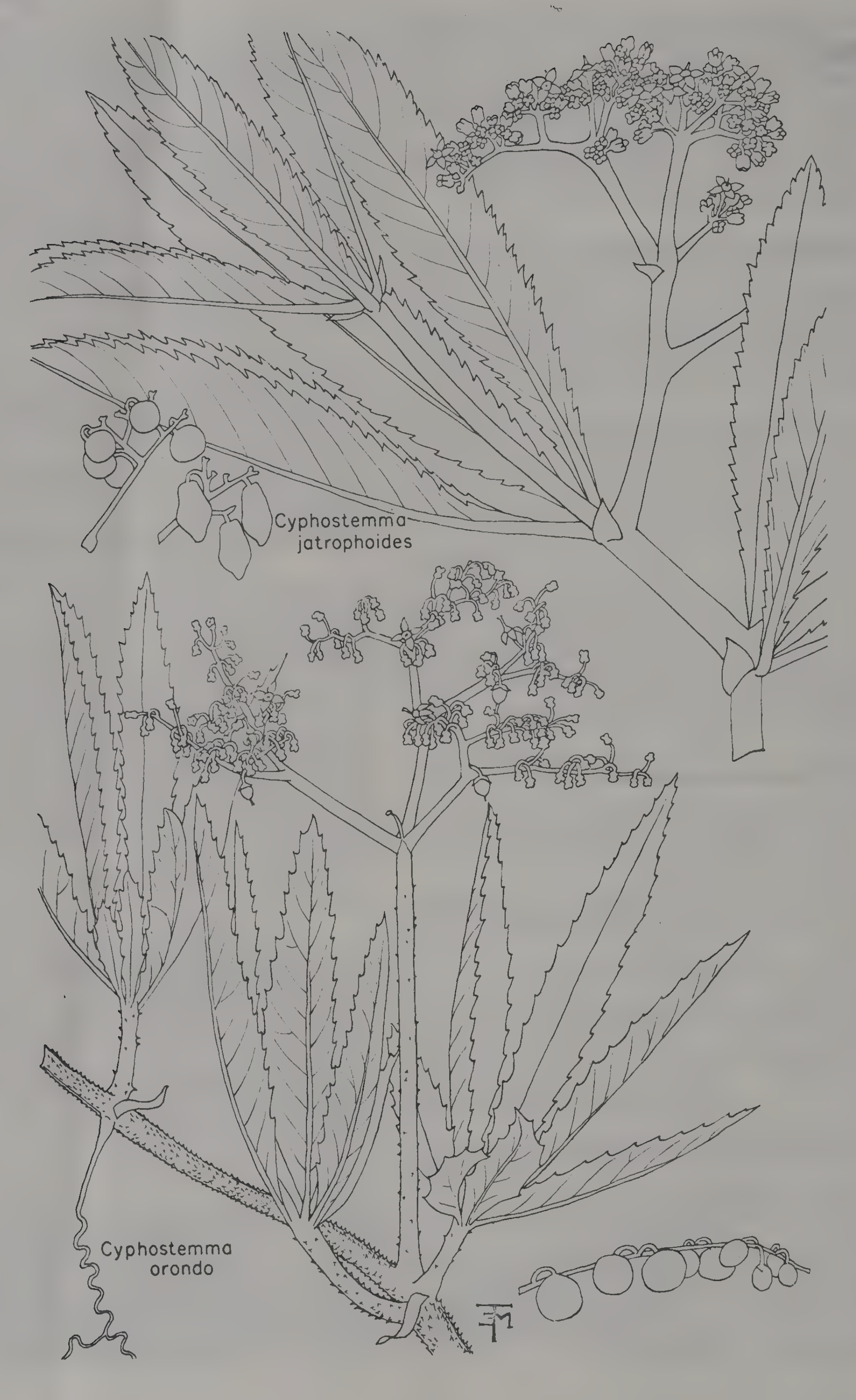
An erect herb without tendrils and with 3–6-foliolate leaves; leaflets glabrous, long-elliptic; glands absent.

Rare plant found in the Kitale district in burnt grassland. HE, HC, KIT.

Bogdan 3713; Tweedie 66/26.

5. LEEA *L.*

Trees or shrubs with pinnate, stipular leaves and without tendrils; flowers in dense, compound leaf-opposed pedunculate cymes; flowers bisexual; calyx 5-lobed; corolla tubular, 5-lobed at apex; stamens alternating with truncate staminodes both fused to corolla tube and projecting downwards into it; fruit a berry, lobed, with 3–8 seeds.


Cyphostemma
jatrophoides
Cyphostemma
orondo

Leea guineensis *G. Don*

A shrub or weak tree to 3 m, with large, glabrous, bipinnate, serrate leaves; flowers orange or red; fruits red, becoming black.

Only found in Kakamega forest, and should be looked for in other wet forests in western Kenya. MUM.

Gillett 16687.

6. RHOICISSUS *Planch.*

Perennial tendrillate shrubs or ± woody climbers; leaves 3-foliolate (in ours), rarely simple or 5-foliolate; inflorescences of leaf-opposed umbellate cymes; petals 5–6; anthers bending over gynoecium; seeds 1–2.

1 Leaflets obovate, dentate or sinuate-dentate, tomentose below 1. *R. tridentata*
Leaflets lanceolate, entire, glabrous below 2. *R. revoilii*

1. Rhoicissus tridentata (*L. f.*) *Wild & Drummond* (see p. 350)

Small tendrillate shrub or climber; leaflets dentate, obovate, often glabrous above, always tomentose below; no tendril on inflorescence branches.

Occasionally found in dry scattered *Combretum* woodland of the uplands. HA, KIT, MUM, KIS, NAR, RV, EMB, MAC, NBI.

Agnew, Musumba, and Kiniaruh 8426; Nattrass 858.

2. Rhoicissus revoilii *Planch.*

Similar to *R. tridentata* except for the leaflets being entire, lanceolate and glabrous.

Found in dry scrubland and *Combretum* woodland and riverine forests. HA, KIS, NAR, MAC, NBI.

Agnew, Musumba, and Kiniaruh 7943; Birch 61/117.

67. SAPINDACEAE†

Trees, shrubs or tendrillate climbers; leaves alternate (rarely opposite), simple or (in ours) divided, petiolate, rarely stipulate; inflorescence usually a raceme or panicle; flowers bisexual (in ours) or unisexual, often zygomorphic; sepals imbricate 4–5, ± connate; petals 3–5, free; stamens 5–12 (often 8), hypogynous; disc extra-staminal; filaments hairy; anthers 2-celled; ovary superior, usually with 3 carpels with 1–2 axile ovules in each; fruits capsular or indehiscent.

A family mainly of trees but with two genera of herbaceous or woody climbers.

1 Plant herbaceous; leaves ternate; fruit a bladder-like membranous capsule 1. *Cardiospermum*
Plant woody; leaves pinnate; fruit a hard bony capsule 2. *Paullinia pinnata*

† By S. Kibe and A. D. Q. Agnew.

1. CARDIOSPERMUM *L.*

Annual or perennial climbers; leaves petiolate, biternately compound; inflorescence axillary, corymbose, with a pair of tendrils at the apex of peduncle; flowers pedicellate, zygomorphic; petals 4 in two pairs; stamens 7–8; anther 2-lobed, fruit a bladder-like inflated membranous capsule of 2 cells with 2 black seeds in each.

1 Petals 2–6 mm long; fruit ± spherical or conical 2
Petals 7–10 mm long; fruit ovoid 1. *C. grandiflorum*
2 Petals 3–4 mm long; primary branches of inflorescence 3 2. *C. halicacabum*
Petals 5–6 mm long; primary branches of inflorescence 4 or more 3. *C. corindum*

1. Cardiospermum grandiflorum *Swartz*

Herbaceous climber, stem hirsute with crisped hairs (2 mm) or glabrous; leaflets deeply crenate, lower surface tomentose with long hairs on the veins; inflorescences with 2 successive whorls of pedunculate racemes; petals 7–10 mm long; fruit ellipsoidal.

Occasionally found in upland forest edges on rocky ground. HC, MUM, KIS, BAR.

Verdcourt 1701; Strid 3388.

2. Cardiospermum halicacabum *L.*

Annual herbaceous climbers with ± woody, sulcate, pubescent or glabrous stem; leaflets incised serrate, ovate; inflorescence an umbel with 3 pedunculate racemes; petals 3–4 mm long; fruit ± spherical.

Found in grassy woodland and *Acacia* forests on rocky or stony ground. HA, KIS, MAG, EMB, MAC, KAJ.

Verdcourt and Napier 2179; Hanid and Kiniaruh 752.

3. Cardiospermum corindum *L.*

Similar to *C. halicacabum* except for the more rounded leaflet-lobes, the petals 5–6 mm long, and 4 or more primary branches of the inflorescence.

Found in *Commiphora* bush on rocky hillsides and riversides. HC, BAR, MAC, KAJ.

Gillett 18216; Agnew, Kibe, and Mathenge 10575.

2. PAULLINIA *L.*

Woody climbing shrubs; stem grooved; leaves 5-foliolate, odd-pinnate, stipulate; tendrils 2, at apex of peduncle; inflorescence axillary, panicu-

late; flowers irregular; sepals 5, unequal; petals 5, unequal; stamens 8; ovary 3-loculed with 1 seed per locule.

Paullinia pinnata *L.*

A woody climbing shrub with imparipinnate leaves with a broadly winged petiole; leaflets 3–5, obovate-elliptic, widely crenate, hairy only on nerves and their axils; inflorescence a raceme-like panicle.

Uncommon plant found in riverine forests and forest edges. MUM.

Agnew and Musumba 8593; Gillett 16699.

68. UMBELLIFERAE†

Annual or perennial herbs or shrubs with alternate, mostly exstipulate, mostly divided leaves with a sheathing base; all parts of the plant with a resinous smell when crushed owing to the presence of oil in oil ducts; flowers bisexual or unisexual in umbels which are often compound, the primary rays subtended by *bracts*, or bracts absent, and the pedicels subtended by *bracteoles* or bracteoles absent; calyx present as 5 teeth or petaloid lobes or obscure; petals 5, free, often inflexed, pointed or notched; stamens 5, inserted at the edge of the nectiferous disc or *stylopodium*; ovary inferior, with 2 uni-ovulate carpels and 2 styles; fruit a dry schizocarp, variously ridged and ornamented.

A large temperate family, not well-represented here but nevertheless confusing. Two members are woody shrubs and trees and are dealt with in KTS, p. 577. A number are cultivated for their flavouring qualities and are liable to escape. The following account includes only some of these.

1 Lower leaves simple — 2
Lower leaves compound — 6
2 Leaves palmately divided, almost to base — 3. *Sanicula elata*
Leaves entire or lobed, but not divided to base — 3
3 Leaves circular in outline — 4
Leaves oblong or oblanceolate or ovate in outline — 5
4 Leaves crenate at margin, unlobed — 2. *Centella asiatica*
Leaves shallowly lobed and crenate — 1. *Hydrocotyle*
5 All leaves simple, ciliate — 4. *Alepidea longifolia*
Upper leaves finely divided into capillary segments — 5. *Coriandrum sativum*
6 Lower leaves simply pinnate, the pinnae simple or pinnatisect, the leaf parallel-sided in outline — 7
Lower leaves 2–4 times pinnate or ternate, and often with the lower pinnae larger than the upper ones — 10
7 Plant with umbels not exceeding the basal rosette of leaves — 9. *Haplosciadium abyssinicum*
Plant with umbels much exceeding the basal rosette of leaves, or without a rosette of leaves — 8
8 Pinnae lobed; outer flowers of umbels with enlarged, notched, outer petals; fruits flattened — 25. *Heracleum*
Pinnae hardly or not lobed; outer flowers of umbels not differentiated; fruits ± globose — 9
9 Umbels with conspicuous reflexed bracts — 17. *Berula erecta*
Umbels without bracts — 15. *Pimpinella*
10 All leaves divided into capillary hair-like segments — 11
All leaves with flattened segments — 15
11 Bracts present, large, oblong, surrounding the base of the contracted fruiting umbel — 19. *Diplolophium africanum*
Bracts absent or few, linear, fruiting umbel not contracted — 12
12 Bracteoles absent; flowers yellow — 14
Bracteoles present; flowers white — 13
13 Plant annual; fruits roughened with small tubercles, unwinged — 13. *Trachyspermum copticum*
Plant perennial; fruits smooth, winged — 22. *Peucedanum*
14 Robust plant with typically inflated stem-leaf bases; fruits strongly winged — 21. *Ferula*
Weak erect herb with narrow leaf bases; fruits unwinged — 20. *Foeniculum vulgare*
15 Fruits dorsally flattened, the two carpels separating along the widest diameter of the fruit, often winged — 16
Fruits globose or ovoid, separating across the narrowest diameter, never winged — 18
16 Plants glabrous; flowers red; fruit glaucous, hardly winged, with thick edges — 24. *Erythroselinum atropurpureum*
Plants glabrous or hairy; flowers red or white; fruit strongly winged with paper-thin edges — 17
17 Plants glabrous; flowers red or cream; fruit retuse above — 23. *Lefebvrea*
Plants glabrous or hairy; flowers pale-yellow to white; fruit entire above — 22. *Peucedanum*
18 Umbels leaf-opposed, sessile with few rays, or apparently simple — 11. *Apium leptophyllum*
Umbels pedunculate, terminal, or apparently reduced to a head — 19

† By A. D. Q. Agnew.

19 Bracts present, more than 3 — 20
Bracts absent, or occasionally 1–2 reduced leaf-bases present at the base of the primary umbel — 23
20 Bracts lobed or divided — 12. *Ammi majus*
Bracts entire — 21
21 Fruit ovoid, covered with hooked hairs; calyx teeth persistent — 8. *Caucalis*
Fruit ± globose, rough with tiny projections or glabrous; calyx teeth absent — 22
22 Plant climbing with twining petioles; leaves ternate to trifoliolate, suborbicular in outline; fruits glabrous — 14. *Pseudocarum eminii*
Plant an erect herb; leaves 2–3 times pinnatisect, lanceolate in outline — 16. *Schimperella aberdarense*
23 Umbels irregular and with less than 5 flowers, without bracteoles; carpels glabrous — 10. *Cryptotaenia africana*
Umbels regular, with more than 5 rays, or if fewer then the fruits densely hairy; bracteoles present. — 24
24 Bracteoles much wider than pedicels, oblong, reflexed; fruit ovoid, beaked, glabrous — 6. *Anthriscus sylvestris*
Bracteoles as wide as, or a little wider than pedicels, erect; fruit globose or hairy — 25
25 Plant trailing; bracteoles longer than pedicels — 18. *Oenanthe*
Plant erect; bracteoles shorter than pedicels — 26
26 Rays of primary umbel 2–3; fruit densely covered with white, glochidiate hairs — 7. *Torilis arvensis*
Rays of primary umbel more than 3; fruit pubescent or glabrous, not densely hairy — 15. *Pimpinella*

1. HYDROCOTYLE *L.*

Creeping perennial herbs with peltate or (in ours) orbicular simple leaves; flowers in whorls, subtended by few bracts; sepals 5, obscure; petals 5, entire; fruit laterally compressed, each carpel with 3 blunt ridges.

1 Plants entirely glabrous — 2
Plants hairy at least on the petioles — 3
2 Usually some leaves more than 2·5 cm in diameter; always some leaves with an apical lobe (opposite the petiole) more deeply cut than the lateral ones — 1. *H. ranunculoides*
All leaves less than 2·5 cm diameter; all leaves hardly lobed, or if shallowly so then the apical lobe no more deeply cut than the lateral ones — 2. *H. monticola*
3 Upper surface of leaf usually hairy; heads with usually more than 12 flowers, on peduncles often longer than petioles — 3. *H. mannii*
Upper surface of leaf glabrous; heads with less than 10 flowers, on peduncles always much shorter than petioles — 4
4 Stem with a few hairs, at least at nodes; heads of 6–10 flowers — 4. *H.* sp. *A*
Stem glabrous; heads of 2–5 flowers — 2. *H. monticola*

1. Hydrocotyle ranunculoides *L. f.*

Leaves erect with fleshy petioles, glabrous, with a circular lamina, cut to leave a well marked apical lobe; heads on short peduncles, 5–9-flowered.

Locally common in ponds and marshes, growing in water between the reeds. HE, HT, HA, RV, KAJ.

Tweedie 2584; Strid 3308.

2. Hydrocotyle monticola *Hook. f.*

Small, often tiny, creeping plant with glabrous upper leaf surfaces and shallowly lobed and crenate leaves; petioles, stems and lower leaf surfaces glabrous or hairy; flowers less than 4, pink-petalled.

Rather a variable small *Hydrocotyle* found on muddy and peaty stream banks in the upper forest levels into the alpine zone. HE, HA, HK.

Hedberg 396; Agnew 8997.

3. Hydrocotyle mannii *Hook. f.*

A tomentose creeper with shallowly lobed leaves and a dense tuft of downward-pointing hairs at the top of the petiole; heads of over 12 green flowers on rather long peduncles.

Quite common on the forest floor in and below the bamboo zone. HM, HA, KIT, KAJ.

Agnew 7126; Glover 1423.

4. Hydrocotyle *sp.* **A.** (see p. 350)

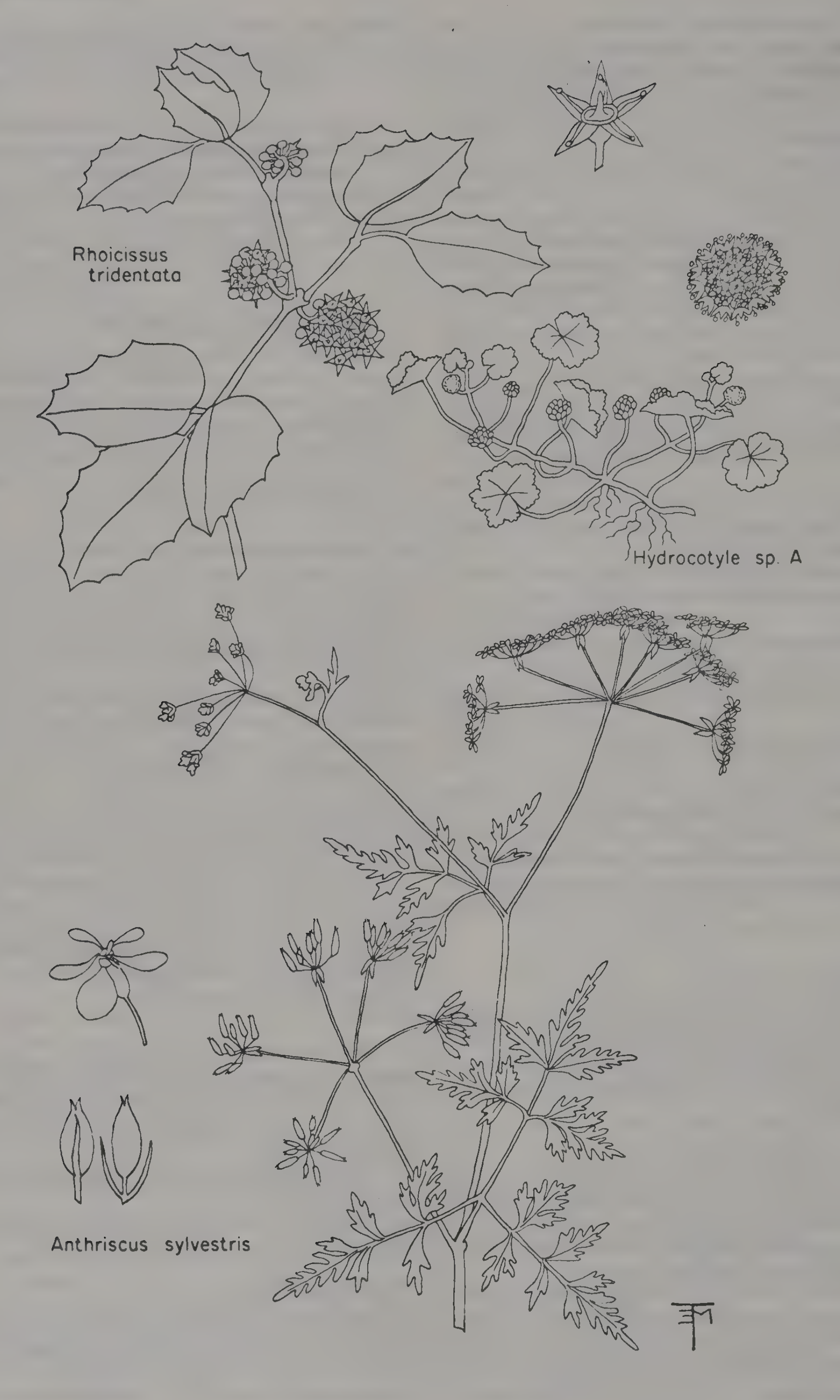
Similar to *H. mannii* but usually smaller, with the upper leaf surface glabrous, with hairs on the stem, and with 6–11 green flowers on the shortly peduncled heads.

In grassland at lower altitudes than *H. mannii.* HT, HA, KIT, KIS.

Drummond and Hemsley 4801; Agnew and Beecher 7038.

2. CENTELLA *L.*

Stoloniferous creeping herbs with suborbicular entire leaves; umbels simple, bracteolate; flowers subsessile; fruit laterally flattened, each carpel being semiorbicular, with 5 obscure ridges.


Rhoicissus tridentata
Hydrocotyle sp. A
Anthriscus sylvestris

Centella asiatica (*L.*) *Urb.*

Creeping sparsely tomentose perennial with reniform or suborbicular cordate, crenate leaves.

Common in grassland, especially the artificial grassland of lawns and roadsides, but often overlooked. HT, HM, HK, MUM, KIS, MAC, NBI.

Hanid and Kiniaruh 666; Faden 67263.

3. SANICULA *L.*

Erect perennials with palmately lobed leaves; umbels irregularly compound; bracts and bracteoles small, few, ± leafy; flowers male and bisexual; calyx teeth 5, acute, longer than the inflexed petals; fruit ovoid, covered with hooked bristles, inconspicuously ridged.

Sanicula elata *Don.* (see p. 352)

Stoloniferous subglabrous herb with rosette of long-petioled, deeply 3–7-palmatisect leaves with ± deltoid lobes; flowers few, the male on short pedicels, the bisexual sessile; fruit covered in reddish hooked bristles.

Common in the shady forest floor of the bamboo zone and the forest below this zone. HE, HM, HA, HK, MUM, KAJ.

Gillett 16696; Agnew 8979.

4. ALEPIDEA *Laroch.*

Erect perennial herbs with simple leaves; flowers sessile, in heads, surrounded by an involucre of the fused bracteoles; flowers bisexual, with 5 ovate sepals and white pink petals with an incurved apex; disc annular; fruit obconical, truncate, crowned by the persistent calyx, tubercled.

Alepidea longifolia *E. Mey.* (*A. massaica* Schlecht. & Wolff) (see p. 352)

A glabrous perennial herb with a rosette of lanceolate ciliate leaves and an erect stem bearing heads in irregular umbels; involucre white, turning pink, persistent.

Locally abundant, in montane grassland, especially on shallow soils and where burnt. HE, HC, HT, HM, HA, HK, MUM

Agnew 7223; Moreau 174.

5. CORIANDRUM *L.*

Annual herbs with entire to tripinnatisect leaves; umbels compound; bracts absent; bracteoles few; flowers male and bisexual, white or pink; sepals well-developed, green; fruit globular, crowned by the persistent calyx, smooth or faintly ribbed.

Coriandrum sativum *L.*

An erect annual with leaves entire at base, divided above, and with pink flowers.

Commonly cultivated for its fruits, coriander occasionally escapes and has been recorded at Nairobi and Kisii as a weed. KIS, NBI.

Verdcourt 1522.

6. ANTHRISCUS *Pers.*

Annual or biennial herbs with 2–3 times pinnate leaves; umbels compound with no bracts but many bracteoles; calyx teeth absent or obscure; petals notched, with an inflexed point, white; fruit ovoid or oblong, each carpel ± terete, smooth and obscurely 5-angled.

Anthriscus sylvestris (*L.*) *Hoffm.* (see p. 350)

An erect, glabrous or tomentose, perennial herb with twice pinnate leaves deltoid in outline; leaf segments lobed or serrate; outer flowers of umbels with enlarged petals.

Fairly common in the bamboo and forest zones on our mountains, and often found on disturbed pathsides. HE, HT, HM, HA, HK, RV.

Agnew, Hedberg, and Mmari 9634; Glover 1456.

7. TORILIS *Adans.*

Annual herbs with 1–3 times pinnate leaves; umbels compound; bracts few or absent, bracteoles present, narrow; calyx teeth 5, triangular; petals pinkish or white, inflexed; fruit ovoid, each carpel with 5 ridges, and covered with spines or hairs.

Torilis arvensis (*Huds.*) *Link* (see p. 353)

An erect, sparsely hairy annual with lanceolate-linear, remotely toothed, leaf-lobes; umbels of few (3–4) rays; flowers pinkish; fruit with glochidiate white hairs.

Locally common along paths in drier upland forest particularly around Nairobi. HE, HC, HT, HM, HA, HK, KIT, MAC, NBI, KAJ.

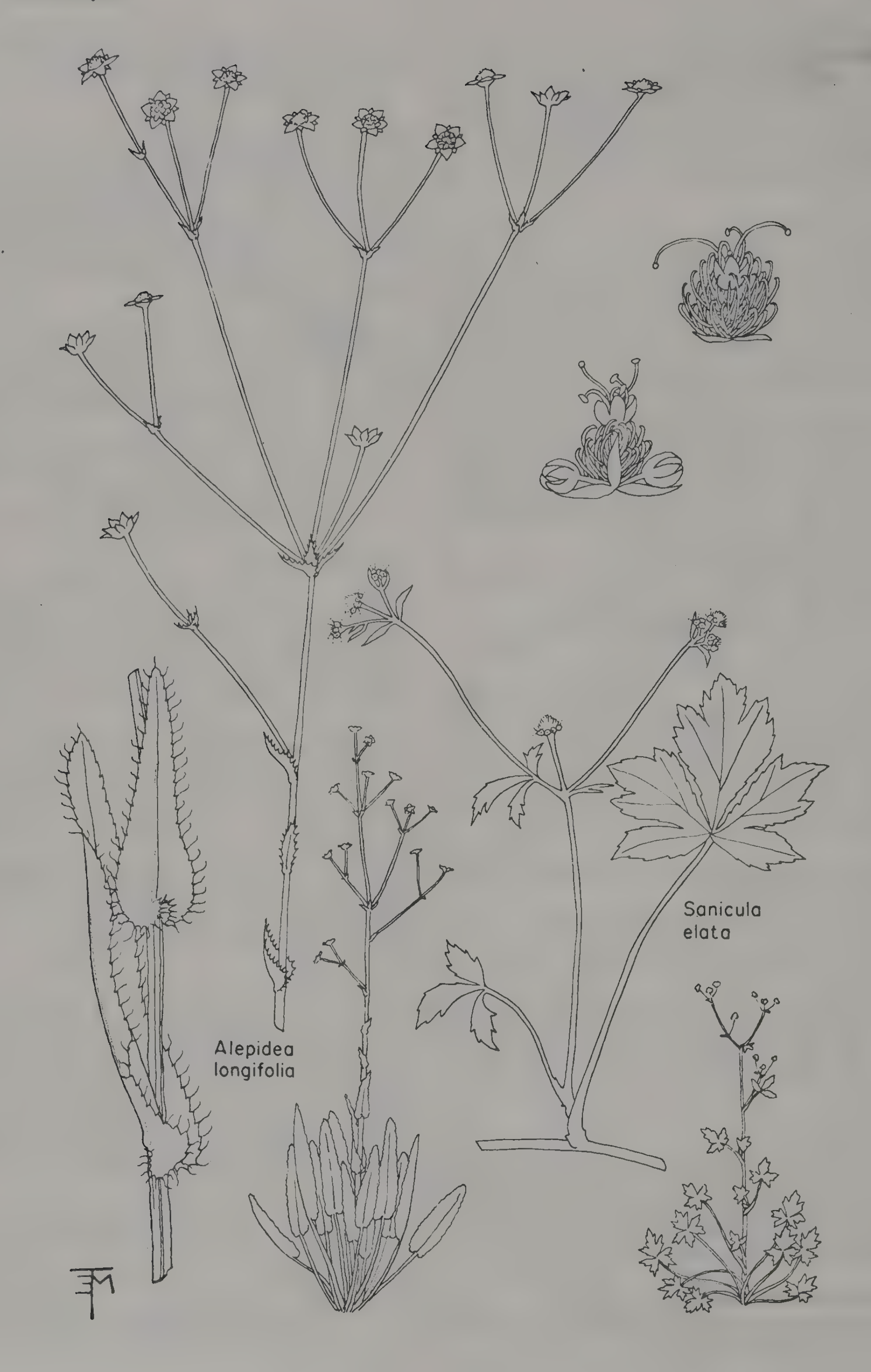
Tweedie 66/262; Gillett 16136.

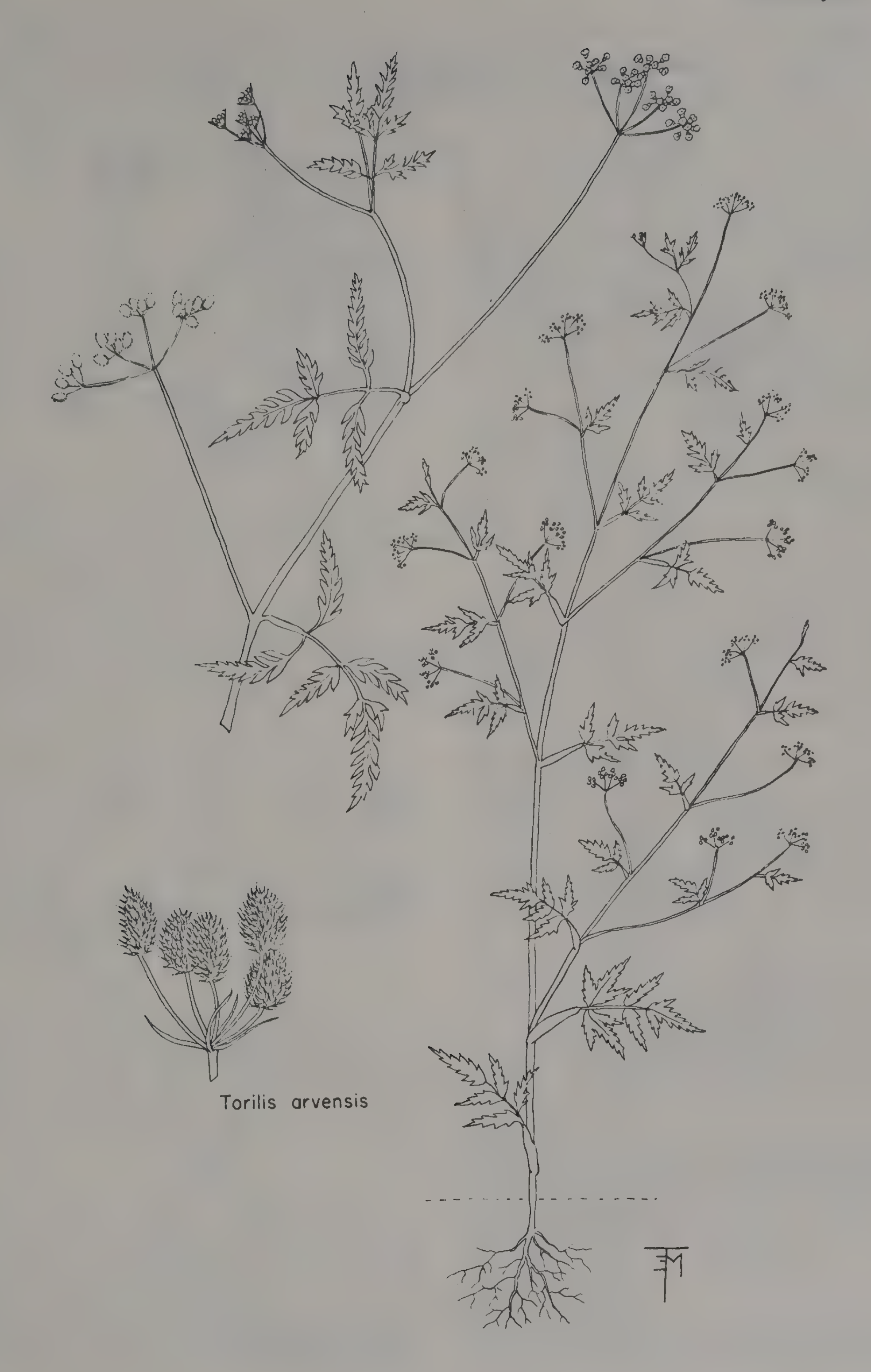
8. CAUCALIS *L.*

Annuals or perennials with 2–3 times pinnate leaves; umbels compound, but often condensed; bracts and bracteoles numerous; flowers bisexual and (in ours) unisexual, the outer bisexual, white or pink; calyx teeth 5, acute or capillary; petals inflexed; fruit ovoid, each carpel with primary ridges and secondary ridges usually hairy as well as bearing glochidiate spines.

1 Primary umbels with rays longer than the bract at least in fruit; style and calyx teeth longer than the uppermost glochidiate spines in fruit 1. *C. pedunculata*

Primary umbels condensed, the rays absent or at least much shorter than the bracts, the


Alepidea
longifolia
Sanicula
elata



Torilis arvensis


Caucalis melanantha
Pimpinella keniensis

inflorescences resembling a head; style and calyx teeth much shorter than the spines 2
2 Ultimate leaf segments linear, entire; petals purple, persistent 2. *C. melanantha*
Ultimate leaf segments broader than linear, serrate to dentate; petals white or rarely purple, fugaceous 3. *C. incognita*

1. Caucalis pedunculata *Bak. f.*

Weak-stemmed tomentose perennial from fusiform rootstock bearing 3 times pinnate and pinnatifid leaves, ovate in outline, the ultimate segments oblong; umbels and flowers pedunculate and pedicellate respectively; flowers white.

Uncommon plant found in wooded grassland in western Kenya. HC, KIT, KIS.

Hanid and Kiniaruh 820; Symes 524.

2. Caucalis melanantha (*Hochst.*) *Benth. & Hook. f.* (see p. 354)

Tomentose perennial from fusiform rootstock, often forming a rosette, seldom stemmy, with 2–3 times pinnatisect leaves, lanceolate-linear in outline, the ultimate segments linear; flowers purple, sessile in a head.

Uncommon plant found in high altitude grassland. HE, HC, HM, HA, HK.

Napier 648; Fleming in EAH 12652.

3. Caucalis incognita *Norman*

A tomentose, weak-stemmed annual herb, often semi-scandent, with 3 times pinnatisect leaves, ovate to deltoid in outline, with ovate to oblong dentate segments; umbels ± sessile in a head; petals white, rarely purple.

Abundant in all upland areas in forest edges and grassland. The fruits can be a nuisance to one's dog and one's trousers. HE, HC, HT, HM, HA, HK, MAC, KAJ, KIS.

Agnew 7225; Kokwaro 6.

9. HAPLOSCIADIUM *Hochst.*

Glabrous herbs with pinnate leaves; umbels compound with several bracts and bracteoles; calyx teeth small; petals entire, inflexed, white; fruit ovoid, laterally compressed with 5 blunt ridges on each carpel.

Haplosciadium abyssinicum *Hochst.*

A perennial rosette herb; leaves pinnate with pinnatisect pinnae; peduncle of umbel short and hidden in rosette; flowers numerous; fruit geocarpic on recurved umbel rays.

Common in disturbed places and solifluction soil in the alpine and highland grasslands of East Africa, this plant usually has its leaves and fruiting umbels so tightly appressed to the ground that they spring downwards when the plant is dug up. HE, HC, HM, HA, HK.

Hedberg 1786; Lind and Agnew 5155.

10. CRYPTOTAENIA *DC.*

Erect perennial herbs with ternate leaves; umbels compound with neither bracts nor bracteoles; calyx of 5 obtuse teeth; petals white, inflexed; fruit elongate, narrowed and beaked with the persistent styles above, smooth, hardly angled.

Cryptotaenia africana (*Hook. f.*) *Drude*

A ± tomentose perennial with a rosette of (sometimes incompletely) ternate leaves with suborbicular to lanceolate, dentate leaflets; umbels with few rays, lax.

Uncommon plant found in the forest floor of wet montane forest. HE, HC, HT, HM, HA, HK, KIT, KAJ.

Kabuye 79; Strid 3170.

11. APIUM *L.*

Annual (in ours) or perennial glabrous herbs with pinnate or ternate leaves; umbels often leaf-opposed, simple compound, usually without bracts or bracteoles; calyx teeth obscure or absent; petals entire, sometimes inflexed; fruit ovoid, ± laterally compound, each carpel with 5 smooth ridges.

Apium leptophyllum (*Pers.*) *Benth.*

An erect annual with leaves orbicular in outline, divided into capillary segments; umbels sessile, leaf-opposed, without bracts or bracteoles.

A recent adventive in the Nairobi district, this little annual with minute white flowers grows in disturbed stony places. NBI.

Harmsen 6509; Gillett 18345.

12. AMMI *L.*

Annual glabrous herbs with 2–4 times pinnate and pinnatisect leaves; umbels compound terminal; bracts and bracteoles numerous, the bracts often branched; calyx teeth absent; petals inflexed; fruit ovoid or subspherical, each carpel with 5 smooth narrow ridges.

Weeds of the Middle East, the following species of this genus has been cultivated for its ornamental flowers and has escaped in places. Another species *A. visnaga* (L.) Lam. has capillary leaf segments and may turn up in the future.

Ammi majus *L.*

An erect annual herb with twice pinnate leaves with pinnatisect pinnae, the ultimate segments oblanceolate or elliptic, serrate; bracts divided into

linear segments; flowers white, minute, in big showy umbels.

Naturalized. NAN, NBI.

Wood in EAH 10400; Agnew 9910.

13. TRACHYSPERMUM *Link*

Similar to *Ammi*, but with simple bracts and muricate roughened fruits.

Trachyspermum copticum (*L.*) *Link*

An erect annual with leaves oblong in outline, bipinnatisect into linear segments; flowers white.

A weed of arable land, common in Ethiopia and only once recorded from Kenya as a casual in Nairobi. NBI.

Whellan 1848.

14. PSEUDOCARUM *C. Norman*

Trailing herbs with ternate leaves; umbels compound; bracts and bracteoles numerous, broad; calyx teeth absent; petals shortly inflexed, white; fruit ± globose, glabrous, each carpel with 5 narrow wings.

Pseudocarum eminii (*Engl.*) *Wolff*

A ± glabrous climber (by means of petioles) with trifoliolate or ternate leaves with ovate-lanceolate, acute, dentate leaflets; bracts and bracteoles oblong.

Very common in the bamboo zones of mountains, especially where disturbed or where the bamboo has flowered and died. HA, HK.

Agnew 7129; Battiscombe 278.

15. PIMPINELLA *L.*

Annual or perennial herbs often with pinnate leaves; umbels compound with no bracts and few or no bracteoles; flowers white or pinkish with obscure calyx and petals with an inflexed point; fruit ovoid or oblong, laterally compressed, each mericarp with 5 obscure ridges; styles often recurved, with capitate stigmas.

1 Plant annual; fruits pubescent — 2
  Plant perennial; fruits pubescent or glabrous — 3
2 All ieaves ternately divided into linear segments — 1. *P.* sp. *A*
  At least the lower leaves pinnate with ovate to orbicular leaflets — 2. *P. volkensii*
3 Fruits glabrous — 4
  Fruits hairy — 3. *P. peregrina*
4 Leaflets sharply serrate; pedicels glabrous — 4. *P. keniensis*
  Leaflets crenate or obtusely serrate; pedicels minutely pubescent — 5
5 Fruit with the ovary truncate above, and capped by the enlarged disc glands — 5. *P. kilimandscharica*
  Ovary of fruit narrowing above into the small disc glands — 6. *P. friesiorum*

1. Pimpinella *sp.* **A.**

An erect annual with leaves much dissected into linear segments; fruits turning brown, finely bristly-pubescent but without hooked hairs.

Rare plant found in dry country. MAC.

Bogdan 4371.

2. Pimpinella volkensii *Engl.*

An erect annual with pinnate lower leaves with ovate often cordate leaflets; fruit appressed pubescent on almost glabrous pedicels.

Common in cultivated ground in western Kenya. HE, HC, HA, KIT, MUM.

Symes 759; Tweedie 66/316.

3. Pimpinella peregrina *L.*

An erect perennial (possibly biennial) with pinnate leaves and suborbicular crenate leaflets, the terminal one cordate; ripe fruits with spreading hairs on ± contracted umbels.

Rare plant found in upland grassland and only known from a few specimens. HA, HK.

Kabuye 12; Greenway and Napper 13551.

4. Pimpinella keniensis *Norman* (see p. 354)

An erect perennial or biennial, the branches often opposite above, with pinnate or twice pinnate leaves bearing sharply serrate, ovate to suborbicular cordate leaflets; leaflets becoming narrow and dissected above; fruit and pedicels glabrous.

Common in some areas of upland grassland on well-drained soils. HE, HC, KIT, MUM, NAR, RV, MAC, KAJ.

Agnew, Hanid, and Kiniaruh 9205; Symes 755.

5. Pimpinella kilimandscharica *Engl.*

An erect stoloniferous perennial, with pinnate leaves and crenate leaflets; umbels with glabrous fruits and finely pubescent pedicels; fruits ± cubical with an enlarged disc above.

Rare plant found in alpine grassland and heath. HE, HA, HK.

Taylor 3476; Agnew 7216.

6. Pimpinella friesiorum *Wolff*

Similar to *P. kilimandscharica* but with larger leaflets and the fruit narrowing above.

Found in the upper levels of montane forest and in the heath zones. HA, HK.

Moreau 125; Agnew 7700.

16. SCHIMPERELLA *Wolff*

Erect herbs with 2–3 times pinnate leaves; umbels compound with few linear bracts and several bracteoles; calyx of 1–3 blunt obscure teeth; petals white, shortly incurved; fruit ± globose, each carpel hemispherical, densely roughened with minute protuberances but not grooved or winged.

Schimperella aberdarense *Norman*

An erect glabrous herb, possibly biennial, with 3 times pinnate leaves with lanceolate, serrate acute segments; fruits up to 1·8 mm long.

Rare plant found in disturbed places in montane forest. HE, HM, HA.

Agnew 7264; Napier 605.

17. BERULA *Koch*

Herbs with simply pinnate leaves; umbels compound, leaf-opposed; bracts present, numerous; bracteoles present, numerous; calyx of 5 minute teeth; petals shortly inflexed, greenish; fruit ± sub-spherical, the mericarps ± hemispherical with 5 narrow wings.

Berula erecta (*Huds.*) *Coville*

A trailing glabrous herb with the leaf pinnae lanceolate or ovate, serrate, sometimes the lowermost lobed at base; fruit 2–5 mm long.

Rare, so far only found at the water's edge of Lake Olbolossat in our area. HA.

Lind, March 1964; Meinertzhagen in AN 9382.

18. OENANTHE *L.*

Glabrous trailing herbs with 1–3 times pinnate leaves; umbels compound; bracts 0 (in ours); bracteoles several, well-developed; calyx teeth 5, conspicuous; petals with an inflexed point, white or greenish; fruit ± globose, each mericarp hemispherical with 5 grooves.

1 Leaflet apices round in outline; bracteoles more than twice as long as pedicels — 1. *Oe. procumbens*

Leaflet apices acute in outline; bracteoles less than 1·5 times as long as pedicels — 2. *Oe. palustris*

1. Oenanthe procumbens (*Wolff*) *Norman*

A creeping perennial, rooting at the nodes, with 3 times pinnate or ternate leaves, ± triangular in outline; leaf segments serrate, each serration with a long bristle-like tip, ± rounded at apex; bracteoles more than twice as long as the pedicels; flowers greenish.

A common plant of the shady floor of bamboo-forest. HC, HM, HA, HK.

Agnew 7124; Glover 1494.

2. Oenanthe palustris (*Chiov.*) *Norman*

Similar to *Oe. procumbens* but larger and much more robust, the leaf segments acute in outline, and with short bracteoles.

Locally common around open water and by streamsides above 6000 ft. HE, HT, HM, HA.

Lind, Harris, and Agnew 5102; Glover 1367.

19. DIPLOLOPHIUM *Turcz.*

Erect glabrous herbs with leaves finely divided into linear segments, with inflated sheathing bases; umbels compound; bracts and bracteoles numerous and large; calyx teeth absent or obscure; petals shortly or not at all inflexed; fruit terete or ovoid, each mericarp obscurely 5-ridged and grooved.

Diplolophium africanum *Turcz.*

An erect perennial with long capillary leaf segments, glabrous except for the inflorescences; bracts and bracteoles pubescent, ovate, as long as the umbel rays and pedicels respectively, yellowish; umbel rays pubescent, curved inward in fruit, holding the loose, pubescent mericarps in a cup.

Locally abundant in upland wooded grassland. HC, HM, HA, KIT, MUM, RV, KAJ.

Hanid 192; Verdcourt 1709.

20. FOENICULUM *Mill.*

Glabrous erect herbs with the leaves divided into capillary segments; umbels compound; bracts and bracteoles absent or few; flowers yellowish; calyx teeth absent; petal-tip obtuse, incurved; fruit oblong or ovoid, terete, with 5 ridges and furrows in each carpel

Foeniculum vulgare *Mill.*

An erect, often glaucous biennial with much-divided leaves with capillary segments; bracts and bracteoles absent.

An escape from cultivation, apparently naturalized in waste places locally. HT, NBI.

Brodhurst-Hill 549.

21. FERULA *L.*

Large glabrous herbs with leaves divided into capillary segments and with widely inflated petioles; umbels compound, without bracts or bracteoles; calyx teeth present, small; petals yellow, inflexed; disc flat; fruit dorsally much compressed, broadly winged with 3 well-separated longitudinal ridges in the centre, entire.

1 Umbels on peduncles which are longer than the sheaths of the subtending stem-leaves — 1. *F. communis*

Umbels on peduncles which are shorter than the inflated leaf bases of the subtending leaves 2. *F. montis-elgonis*

1. Ferula communis *L.*

An erect herb, often very tall (to 3 m), with very large finely divided leaves at base and many yellow umbels subtended by inflated leaf-bases above; fruits nearly 2 cm long, pear-shaped in outline.

Conspicuous where it occurs in disturbed areas of dry evergreen woodland, this plant is never found in large numbers. RV, HM, HA, NAN.

Agnew, Azavedo, and Khatri 9570; Verdcourt 3202.

2. Ferula montis-elgonis *Bak.*

Similar to *F. communis* except for the characters used in the key, this plant is still only known from the type from 12 000 ft on Mt. Elgon. It may eventually turn out to be merely an aberrant form of *F. communis*, and should be searched for. HE.

Lugard 425 (leaf-material only).

22. PEUCEDANUM *L.*

Perennial herbs with (in ours) 2–4 times pinnate or ternate leaves; umbels compound with usually few or no bracts and many bracteoles; 2–3 sepals often present; petals with an inflexed point; fruit flattened dorsally, each mericarp elliptic to orbicular, broadly winged, with 3 raised ridges.

1 Leaves much dissected, the ultimate segments linear or oblong, entire 2
  Leaves 2–4 times pinnatifid, the segments broader than linear, always serrate or crenate 6
2 Stem and leaf rachis tomentose, and densely hairy at nodes and pinna-insertions 1. *P. kerstenii*
  Stem and leaf rachis glabrous or if minutely pubescent then not more densely hairy at nodes and pinna-insertions 3
3 Stem just below primary umbel with small soft pubescence of minute flaps of tissue; fruit over 9 mm long 2. *P. canaliculatum*
  Stem just below primary umbel glabrous or puberulous only; fruit less than 9 mm long 4
4 Ultimate leaf segments linear or capillary 5
  Ultimate leaf segments oblong 3. *P.* sp. *A*
5 Lower leaves with lamina less than 8 cm long 4. *P. friesiorum*
  Lower leaves with lamina more than 10 cm long 5. *P. aberdarense*
6 Stem roughened by the presence of soft corky flaps 6. *P. aculeolatum*
  Stem smooth 7
7 Stem tomentose or pubescent; fruits entire 7. *P. elgonense*
  Stem glabrous; fruits strongly cordate below 8. *P. linderi*

1. Peucedanum kerstenii *Engl.*

A large tomentose herb with an erect stem to 2 m, with big, finely divided leaves which are lanceolate in outline; flowers cream.

Common beside streams in montane situations, at the top of the forest and in the alpine zone. HE, HM, HA, HK.

Agnew 7193; Gillett 18442.

2. Peucedanum canaliculatum *Verdc.*

An erect glabrescent herb with leaves ovate in outline, finely divided into channelled, linear segments; flowers white.

Uncommon plant found in dry grassland. HA, NAN, KAJ, MAG.

Verdcourt 3845; Agnew 8897.

3. Peucedanum *sp.* A.

An erect, minutely pubescent herb with leaves lanceolate in outline, 3–4 times pinnate into pinnatisect lobes, the ultimate segments oblong, entire; flowers white.

Only collected once at Eburru, in vlei grassland at 8000 ft. HM.

Agnew, Azavedo, and Khatri 9539.

4. Peucedanum friesiorum *Wolff*

A stoloniferous glabrous herb with an erect stem from a rosette of leaves; leaf lamina ovate to suborbicular in outline, divided into capillary segments; flowers white.

Locally common on stream banks and marshes in alpine grassland. HA, HK.

Hanid 87; Meinertzhagen 9374.

5. Peucedanum aberdarense *Wolff*

Similar to *P. friesiorum* in all respects but bigger and found in the uppermost forest zones, this may turn out to be only a variety of the latter.

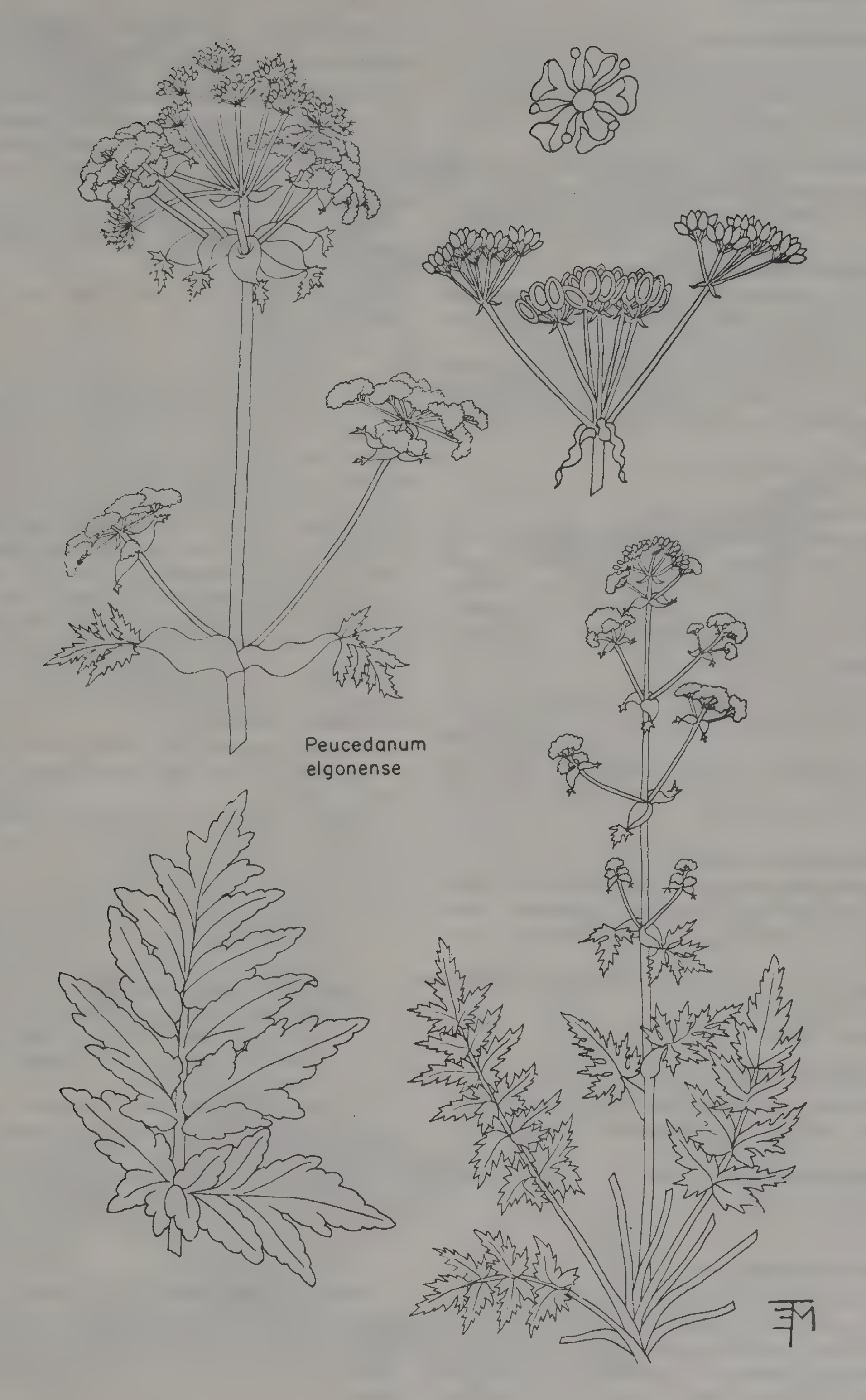
Agnew, Hedberg, and Mmari 9624.

6. Peucedanum aculeolatum *Engl.* (see p. 361)

An erect herb, often massive, ± glabrous except for the soft scales on the stem; leaves 2–3 times ternate, triangular in outline, with ovate, crenate, ± lobed leaflets; flowers white.

Locally common in clearings in montane forest, especially around Limuru. HC, HM, HA, KAJ.

Agnew 8296; Kerfoot 5033.


Peucedanum
elgonense

7. Peucedanum elgonense *Wolff* (see p. 359)

An erect tomentose perennial to 1·5 m tall, with 2–3 times pinnatisect leaves ovate-lanceolate in outline; leaf segments lanceolate, crenate; flowers white.

A common plant in streamside marshes in the subalpine zone. HE, HC, HT, HM, HA, HK.

Part II Botany 88; Le Pelleij in EAH 19310.

8. Peucedanum linderi *Norman*

An erect perennial similar to *P. elgonense* but glabrous and with the leaf segments oblong-elliptic and serrate; fruit deeply cordate at base.

The only Kenya *Peucedanum* with a cordate fruit-base, this plant is found in forest clearings and pathsides in lower montane forest. HE, HT, HM, HA.

Kerfoot 4330; Strid 3412.

23. LEFEBVREA *A. Rich.*

Usually a biennial or annual glabrous herb with ternate leaves; umbels compound with 1–3 or no bracts and a few slender bracteoles; calyx absent; petals cream or yellow, inflexed; stylopodia heavy, elongated; fruit dorsally flattened, broadly winged, the wings retuse at apex.

1 Stylopodia (disc-glands) elongated, twice as long as broad, conical, narrowing above — 1. *L. abyssinica*
  Stylopodia (disc-glands) short, cylindrical, up to 1·5 times as long as broad, blunt and truncate above — 2. *L. brevipes*

1. Lefebvrea abyssinica *A. Rich.*

An erect glaucous herb with ternate or pinnate leaves bearing long lanceolate, remotely serrate leaflets; stylopodium long and conical; petals yellow.

Rare plant found in savannah of western Kenya. KIT.

Bogdan 3432.

2. Lefebvrea brevipes *Engl.*

Similar to *L. abyssinica* but with usually shorter, broader leaflets and cylindrical, truncate stylopodia.

Uncommon plant found in western Kenya savannah. HE, HM, KIT.

Lugard 275.

24. ERYTHROSELINUM *Chiov.*

Erect herbs with 2–4 times ternate or pinnatifid leaves; umbels compound with 0–2 bracts and a few slender bracteoles; calyx teeth absent; petals red, strongly incurved; disc abruptly conical; fruit dorsally flattened, with thick, pithy margins, hardly ridged on the face and entire at base and apex.

Erythroselinum atropurpureum (*A. Rich.*) *Chiov.*

An erect glabrous annual with very variable leaves, the leaflets often linear, remotely toothed, but sometimes ovate to oblong; fruits pear shaped, glaucous.

Uncommon plant found in upland pastures and disturbed places especially in western Kenya. HA, HM, KIT.

Tweedie 67/272; Drummond and Hemsley 4449.

25. HERACLEUM *L.*

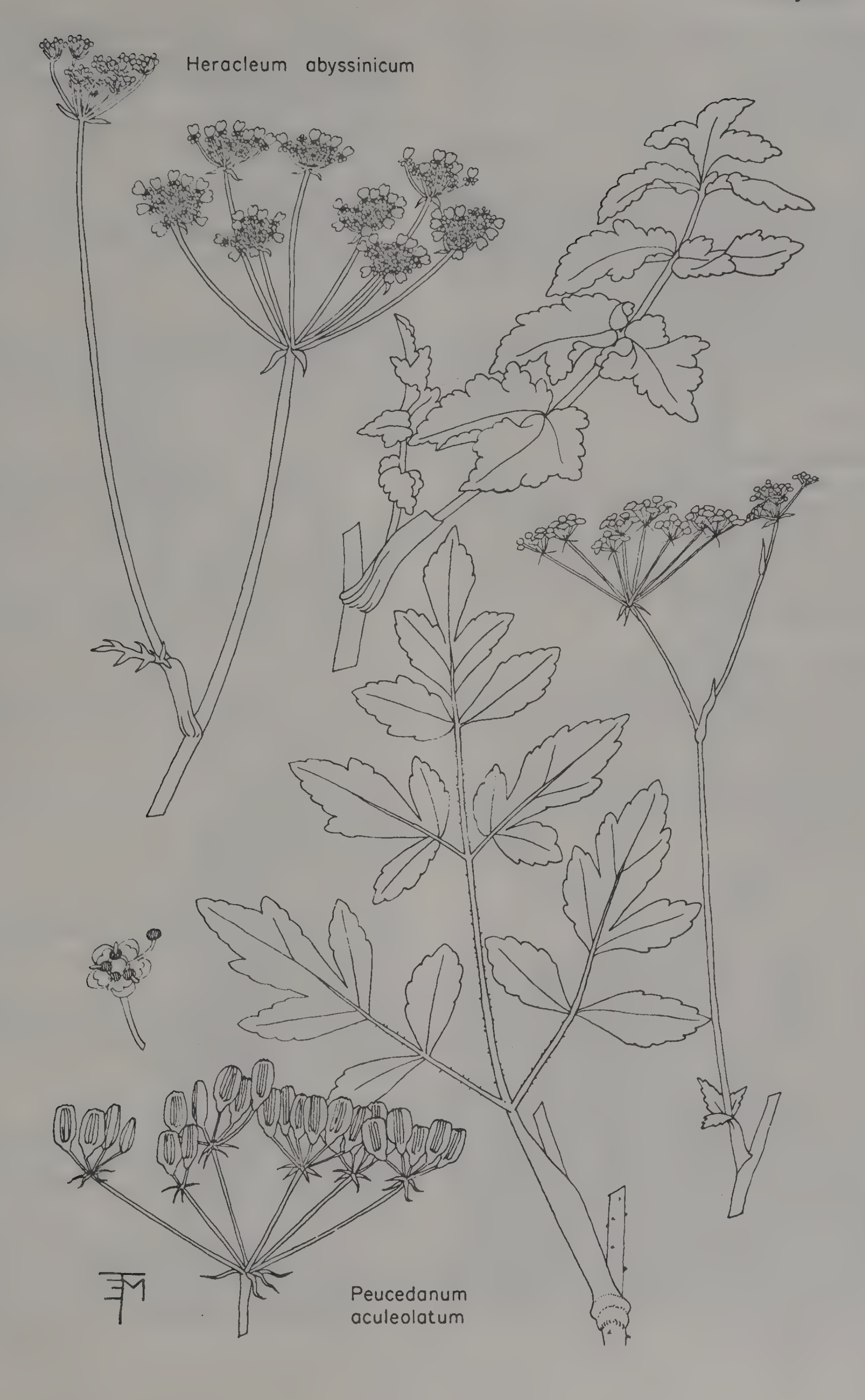
Perennial herbs, hairy (in ours), with 1–3 times pinnate leaves with broad segments; umbels compound with few bracts and many bracteoles; sepals small, unequal; petals often very unequal, the ones on the outside of the umbel enlarged, notched; fruit flattened dorsally, winged, smooth, with 4 incomplete dark lines on the outside and two within.

The genus in Kenya has obviously derived from one stock with specialized groups on every main mountain mass. The status of these plants will be in doubt until experimental work can be undertaken on them, but since one of them at least (*H. elgonensis*) is very distinct, and there is a name available for each, it seems worthwhile at present to recognize them all.

1 Outer petals of the outermost flowers more than 8 mm long; fruit widest below the middle — 1. *H. elgonense*
  Outer petals of the outermost flowers less than 6 mm long; fruit, where known, widest above the middle — 2
2 Stems branching vegetatively above the ground, often prostrate at base; bracteoles usually shorter than flowering pedicels — 2. *H. abyssinicum*
  Stems branching at ground level only, with a rosette of leaves and the aerial stems bearing only inflorescences; at least some bracteoles in each umbel longer than the flowering pedicel. — 3
3 Lower surface of leaves uniformly pubescent; outer petals of outermost flowers less than 2·5 mm long — 3. *H. taylori*
  Lower surface of leaves pubescent or tomentose on the veins, glabrous between the veins; outer petals of outermost flowers 2–6 mm long — 4. *H. inexpectatum*

1. Heracleum elgonense (*Wolff*) *Bullock*

An erect fleshy-stemmed herb from a rosette of pinnate leaves with overlapping crenate pinnae; flowers white with outer petals often over 10 cm long.


Heracleum abyssinicum
Peucedanum
aculeolatum

Common in the alpine zone of Mt. Elgon (to which mountain it is confined) this species grows in marshes. HE.

Hedberg 217; Strid 3557.

2. Heracleum abyssinicum (*Boiss.*) *C. Norman* (see p. 361)

An erect or ± trailing perennial with branching, often ascending stems; leaves pinnate with dentate, often distant segments; flowers white, the outermost petals hardly exceeding 2·5 mm long; fruit broadest above the middle and retuse at apex.

Fairly common in upland grassland, this is probably the closest to the ancestral species from which the alpine ones have developed. HE, HC, HA.

Nattrass 241; Tweedie 67/67.

3. Heracleum taylori *Norman*

An erect herb from a rosette of pinnate leaves with distant, bluntly dentate pinnae; flowers white, fruits not seen.

Rare plant found in the streamsides of the Aberdares above 9500 ft. This plant is represented by only three specimens. HA.

Taylor 1454.

4. Heracleum inexpectatum *Norman*

Similar to *H. taylori* but much bigger in all its parts, and with the pinnae acutely dentate and ± glabrous between the veins below; outermost petals to 6 mm long but usually much less; fruits widest above the middle with a retuse apex.

This is the 'Mt. Kenya version' of the genus; it is abundant in wet screes and streamsides in the alpine zone. HK.

Coe and Kirrika 255; Verdcourt 3729.

69. ERICACEAE†

Wiry evergreen shrubs or small trees; leaves alternate or whorled, simple, needle-like, exstipulate; inflorescence racemose, terminal or lateral, leafy or leafless, bracteate; bracteoles 2 or in whorls of 3; flowers pedicellate; sepals 4–5, ovate, free; corolla-tube 4–5-lobed, bell-shaped; disc present; stamens once or twice sepal number, inserted on the disc, with 2-celled, tailed anthers; ovary superior, 4–5-celled and -loculed with numerous axile ovules; style simple, stigma capitate, fruit mostly capsular.

This family is mainly confined to land above 9000 ft in Kenya, and is better represented in arctic and temperate lands than here. The genus *Philippia* is composed of trees and shrubs which are dealt with in KTS. It differs from *Erica* in its unequal calyx lobes and large peltate stigma.

1 Wiry low shrubs or herbs, less than 50 cm tall — 2
  Trees or shrubs over 50 cm tall — 2. *Erica arborea*

2 Corolla globose, inflated, narrowed at the lobes — 2. *Erica whyteana*
  Corolla cylindrical or funnel-shaped, widest at the lobes — 1. *Blaeria*

1. BLAERIA *L.*

Wiry undershrubs with branched or gland-tipped hairs; leaves pubescent; inflorescence paniculate or racemose; flowers 4–5-merous; corolla-tube dilated above; stamens 4–5; ovules indefinite; fruit a capsule.

1 Flowers and most leaves on short lateral branches which have shorter internodes than the main stem; corolla less than 2 mm long, roughly funnel shaped, narrower at base — 1. *B. johnstonii*
  Most flowers and leaves usually on the ± numerous erect main stems; corolla more than 2·5 mm long, roughly cylindrical — 2. *B. filago*

1. Blaeria johnstonii *Engl.* (see p. 363)

A low pubescent shrub with monopodial branching often giving it a 'christmas-tree' appearance, the leaves and pink flowers being on short lateral shoots.

This plant is common in disturbed highland and alpine places, especially in peaty soils. HE, HC, HA, (?HK).

Agnew 5870; Kerfoot 1453.

2. Blaeria filago *Almy & Th. Fr. jr.*

A low shrub or wiry annual with numerous erect, usually unbranched stems bearing apical racemes of pink flowers.

A very variable plant of disturbed (often burnt) alpine moorland. Glabrous and heavily glandular and tomentose forms occur. HE, HA, HK.

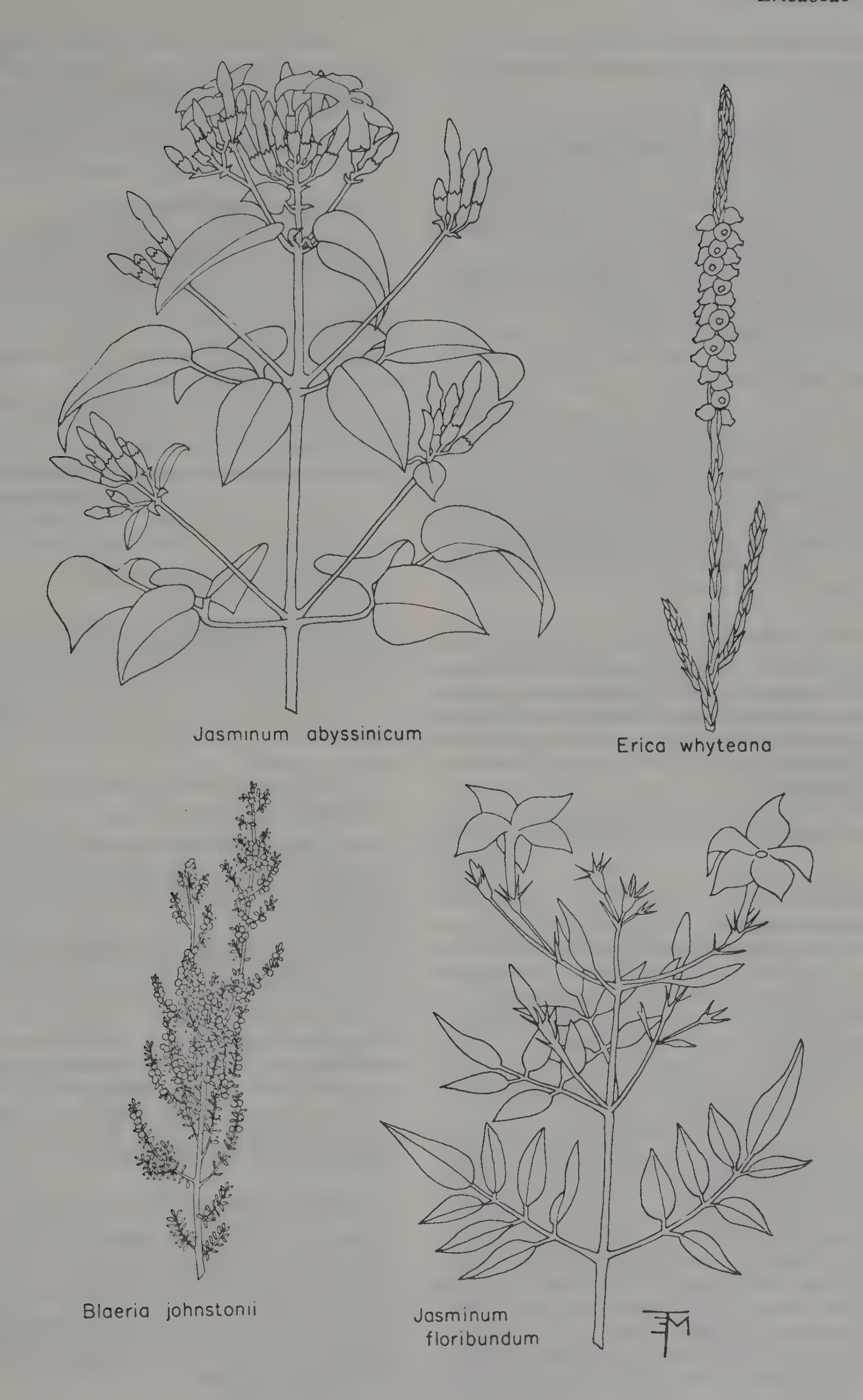
Hanid 95; Hedberg 874.

2. ERICA *L.*

Wiry shrubs or small trees without gland-tipped hairs; leaves glabrous; inflorescence a paniculate raceme or spike-like; stamens 8, hypogynous; fruit a capsule.

1 Trees or shrubs more than 50 cm tall; inflorescence a paniculate raceme — 1. *E. arborea*
  Low woody herbs, less than 50 cm tall; inflorescence spike-like — 2. *E. whyteana*

† By A. D. Q. Agnew.


Jasminum abyssinicum
Erica whyteana
Blaeria johnstonii
Jasminum floribundum

1. **Erica arborea** *L.*

Dealt with in KTS. p. 179. HE, HC, HA, HK, NAR, RV.

2. **Erica whyteana** *Britten* (see p. 363)

Small wiry shrubs up to 50 cm; stem ± glabrous; leaves 5–10 mm long, alternate or in whorls of 3, linear; inflorescences spike-like with axillary, globose, pendulous, pinkish flowers.

A very pretty pink heath, found in marshes or along streams above 9000 ft. HC, HA, HK.

Tweedie 66/392; Taylor 1425.

70. OLEACEAE

Trees, shrubs, or climbers; leaves opposite or rarely alternate, or whorled, simple or compound, exstipulate; inflorescence terminal or axillary, racemose or cymose, bracteolate; flowers bisexual, regular; calyx tube 4–6-lobed, corolla tube 4–6-lobed; stamens 2, epipetalous; disc absent; ovary superior, 2-celled; stigma capitate and lobed; fruit capsular, with 2–4 axile seeds.

1. JASMINUM *Dum.*

Climbing shrubs; leaves opposite or alternate, simple or compound, entire; inflorescence cymose or flowers solitary; calyx tube bell-shaped; corolla-tube cylindrical 4–6-lobed, sweetly scented; seeds solitary in each carpel; fruit a berry, often of separate mericarps.

1 Leaves simple, opposite or ternately whorled — 2
  Leaves compound — 6
2 Leaves glabrous — 3
  Leaves pubescent — 4
3 Leaves ternately whorled; corolla lobes oblong — 1. *J. dichotomum*
  Leaves opposite; corolla lobes lanceolate — 2. *J. meyeri-johannis*
4 Corolla lobes shorter than the tube — 5
  Corolla lobes as long as the tube — 3. *J. parvifolium*
5 Leaf base cordate; corolla lobes lanceolate; calyx lobes filiform — 4. *J. pauciflorum*
  Leaf base rounded; corolla lobes oblong; calyx lobes broad — 5. *J. eminii*
6 Leaves pinnate with more than 2 leaflets — 7
  Leaves trifoliolate — 8
7 Leaves opposite; corolla white, the lobes half as long as the tube — 6. *J. floribundum*
  Leaves alternate; corolla yellow, the lobes a quarter as long as the tube — 7. *J.* sp. *A*
8 Leaves with hairy pits (acarodomatia) along the midrib (in the axils of lateral nerves) extending to or above the middle of the lower surface; calyx lobes 3–4·5 mm long — 8. *J. abyssinicum*
  Leaves with hairy pits only at the base, below the middle of the lower surface; calyx truncate or the lobes 1·5–3 mm long — 9. *J. fluminense*

1. **Jasminum dichotomum** *Vahl*

A glabrous woody climbing shrub with simple, elliptic-ovate, acute to acuminate, petiolate leaves in whorls of 3; inflorescence terminal or axillary; flowers shortly pedicellate, clustered; corolla white to purplish.

Found in open country and riverine forests with *Albizia.* HE, KIT, MUM, KIS.

Bally B 7465; Agnew and Musumba 8597.

2. **Jasminum meyeri-johannis** *Engl.*

A glabrous climbing shrub with simple ovate opposite leaves; inflorescence terminal to the main and to small lateral branches, few-flowered; corolla white to pink.

Found in *Acalypha* scrub. KIS.

Napier 3012 and 2967.

3. **Jasminum parvifolium** *Knobl.*

A twining shrub up to 3 m with densely pubescent young branchlets and glabrous old ones; leaves 10–25 mm long, opposite, simple, puberulous, elliptic-acute; inflorescence 1–4-flowered; corolla white to cream.

Found amongst grazed scrub. MAC.

Shirley Coryndon 1953.

4. **Jasminum pauciflorum** *Benth.*

Similar to *J. parvifolium* except for the 30–55 mm long elliptic-acuminate, often cordate leaves; corolla white.

Found only once in Kakamega forest. MUM.

Dale 3277.

5. **Jasminum eminii** *Gilg*

This species is similar to *J. parvifolium* except for the well-developed acarodomatia on the leaves and the keyed characters; corolla white.

Found growing on rocky ground, roadsides, and evergreen thickets. HA, KIS, NAR, MAC, NBI.

Agnew 7652; Verdcourt 2153A.

6. **Jasminum floribundum** *Fresen.* (see p. 363)

A glabrous perennial climbing or suberect shrub with opposite, typically 5-foliolate leaves; leaflets ovate, acute to acuminate; inflorescence very lax; corolla white.

Found in open hillsides and savannah bush on rocky ground HE, HC, HT, HM, HA, KIT, NAR, RV, MAG, NAN, NBI.

Tweedie 66/232; Archer 92.

7. Jasminum *sp.* **A.**

Similar to *J. floribundum* except in its leaves being alternate, leaflets elliptic, and calyx shortly toothed; corolla yellow.

Found only once in Milimani, Kitale. KIT.

Tweedie 66/131 and 67/140.

8. Jasminum abyssinicum *DC.* (see p. 363)

A climbing shrub with glabrous or hardly puberulous young branchlets and inflorescence; leaves 3-foliolate, opposite; leaflets elliptic, acute to acuminate, usually glabrous; acarodomatia present; corolla lobes less than half the tube length.

Common in wet shrubland, shady and riverine forests. HE, HT, HA, HN, KIT, MUM, NAR, RV, MAC, NBI, KAJ.

Glover, Gwynne, Samuel, and Tucker 2295; Agnew and Beecher 8280.

9. Jasminum fluminense *Vell.*

Similar to *J. abyssinicum* except for the keyed characters.

This species is highly variable, and is common in dry *Combretum-Albizia* bushland on shallow soils. HA, HK, KIS, NAR, MAG, NAN, MAC, NBI, KAJ.

Bell 10637.

71. APOCYNACEAE†

Trees, shrubs, or lianes, rarely herbs with latex; leaves mostly opposite or whorled, simple, entire, exstipulate; inflorescence cymose-paniculate, or flowers solitary, terminal or pseudo-lateral; flowers bisexual, usually 5-merous, regular; calyx lobed, often glandular within, imbricate; corolla-tube variously shaped with contorted-imbricate lobes; anthers 2-lobed, convergent on the style; style split at base; disc present, 5-lobed; ovary superior, 2-carpelled, free below but with common style; ovules 2–numerous; fruit of 2 follicles, or a berry or a capsule; seeds winged or with a crown of hairs.

1 Woody climbers; inflorescence a long or short panicle 2
  Annual or perennial herbs; flowers solitary or paired, axillary 2. *Catharanthus roseus*
2 Panicles terminal; flowers sessile or crowded in the panicle; leaves obtuse or acute; corolla tube more than 5 mm long 3
  Panicles axillary and terminal; panicle loose, with pedicellate flowers; corolla tube less than 5 mm long 1. *Baissea alborosea*
3 Inflorescence of corymbs or cymes, many-flowered; flower more than 3·5 cm long 4. *Saba florida*
  Inflorescence paniculate or of few-flowered corymbs of cymes; flower less than 3·5 cm long 3. *Landolphia buchananii*

† By S. Kibe.

1. BAISSEA *A. DC.*

Tall climbing shrubs, leaves opposite, oblong, acuminate; inflorescence leafy, loosely paniculate or of corymbs of few-flowered cymes; calyx herbaceous, eglandular within, imbricate; corolla 5-lobed, funnel- or bell-shaped, lobes overlapping to the right; stigma campanulate; carpels 2, hairy; ovules numerous, pluriseriate; seeds linear-lanceolate.

Baissea alborosea *Gilg & Stapf*

Woody, tall, climbing shrubs, leaf base truncate, inflorescence paniculate, panicles opposite; corolla lobes longer than the tube, lobes linear-lanceolate.

Found once in Kakamega forest. MUM.

Battiscombe K1212.

2. CATHARANTHUS *G. Don*

Much branched undershrubs or herbs up to 1 m; leaves opposite, exstipulate, axillary glands numerous in a fringe; flowers axillary, solitary or paired, white or pink; calyx herbaceous, eglandular; sepals 5, subulate; corolla salver-shaped, lobes overlapping to the left; stamens inserted in the widest part of the corolla tube; anthers free from stigma; disc replaced by 2 long glands alternating with the 2 free carpels; ovules numerous, in rows; fruit a pod.

Catharanthus roseus (*L.*) *G. Don*

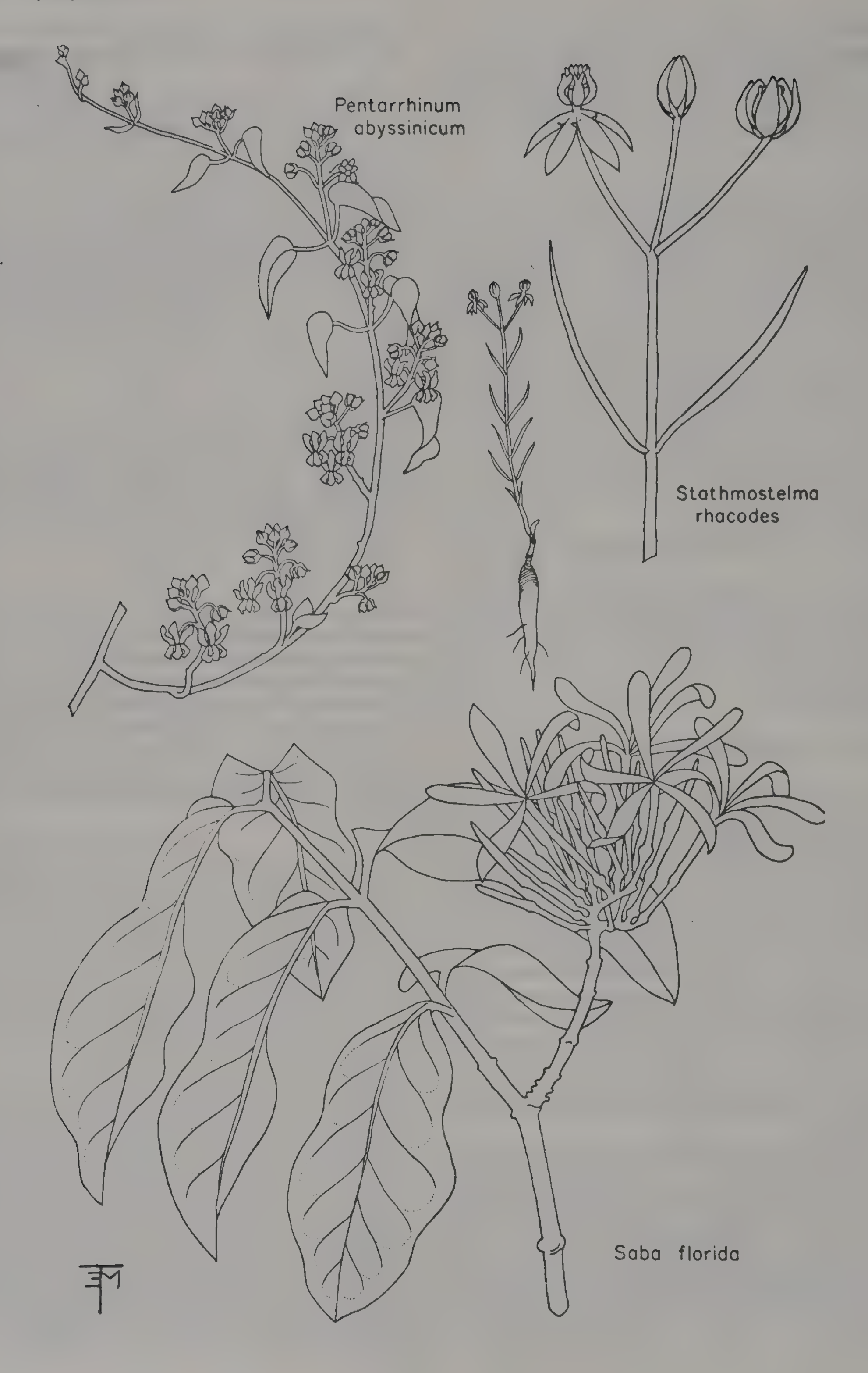
Annual or perennial, much branched undershrubs or herbs; leaves elliptic-oblong, obtuse, fleshy; flowers paired; calyx eglandular, subulate; corolla lobes ovoid; fruit a pod.

An escape from cultivation, found growing in disturbed places, usually near habitation, in drier districts. HA, HK, MUM.

Templer 4; Hanid and Kiniaruh 9717.

3. LANDOLPHIA *Beauv.*

Climbing shrubs; stem lenticellate; tendrils branched or hooked, terminal or pseudo-axillary; leaves elliptic-oblong, often acuminate, rarely obtuse; inflorescence paniculate, terminal; flowers sessile or shortly pedicellate; sepals 5, free or connate below, eglandular; corolla salver-shaped, lobes shorter or longer than the tube, overlapping to the left; ovary entire, 1-celled; ovules numerous, in many rows; fruit a large globose or pear-shaped berry; seeds oblong or ovoid, embedded in juicy pulp.


Pentarrhinum
abyssinicum
Stathmostelma
rhacodes
Saba florida

Landolphia buchananii (*Hall. f.*) *Stapf* (*L. kilimandscharica* Stapf, *L. ugandensis* Stapf)

Woody, climbing shrub; tendrils arising from the branch-forks; leaves elliptic-oblong, shortly acuminate; inflorescence a 5–10-flowered panicle; sepals ovate, obtuse, ± ciliate; corolla lobes ± equal to the tube, yellow or white with touches of red or orange.

Found in riverine forest. HA, HM, HK, KIT, KIS, NAR, MAC, KAJ.

Perdue and Kibuwa 8090; Agnew, Hanid, and Kiniaruh 7917.

4. SABA (*Pichon*) *Pichon*

Woody, climbing or scrambling shrubs; stem glabrous; leaves opposite, large, ovoid-oblong, obtuse, rarely acuminate; inflorescence of corymbs of cymes, overtopped by the two forking branches or pseudo-lateral; flowers sweet-scented, salver-shaped; fruit a large berry.

Saba florida (*Benth.*) *Bullock* (see p. 366)

Climbing or scrambling bush, the stem with numerous dense whitish lenticels; leaves glabrous, leathery; flowers clustered, salver-shaped; corolla lobes as long as the tube or just shorter, oblong; fruit a berry, up to 6 cm in diameter.

Found on stony ground in riverine forests. HA, MUM, KIS, MAC.

Dale 3047; Birch 60/471.

72. ASCLEPIADACEAE†

Herbs, climbers, or shrubs with opposite, entire leaves and usually milky latex; stipules absent or represented by an interpetiolar rim at the nodes; flowers in cymes or umbels, rarely racemes or panicles, regular, bisexual; sepals 5, more or less free; petals 5, connate at base; corona of 5 or more lobes usually present, attached to the corolla or the stamens, sometimes in two whorls, usually acting as nectar dispensers; stamens 5; filaments free or fused; anthers variously and progressively modified from loosely connate, bearing granular pollen, to completely fused to the stigma and each other, bearing pollen in waxy masses (2 per stamen) which are fused to pollen carriers in adjacent pairs (pollinia); carpels 2, free, with a fused capitate stigma; fruit of 2 free follicles, often inflated, dry, bearing very numerous, usually feathery seeds.

A big, biologically successful family, apparently with such an exact pollination apparatus, producing such large quantities of seed from each pollination, that speciation has been rapid. At the same time most species exist in small numbers, being rare or extremely local in occurrence.

† By A. D. Q. Agnew and P. G. Archer (*Ceropegia*).

1 Flowers with a flask-shaped tube, widest at the bottom narrowing above, with the petal lobes apically adherent at anthesis — 36. *Ceropegia*
Flowers with a short tube not narrowing above or without a tube, with the petal lobes mostly free at anthesis — 2

2 Erect or decumbent fleshy-stemmed (cactus-like) herbs or weak shrubs without leaves, with the nodes and opposite leaf positions usually obscure; stems never twining — 43
Leafy herbs, shrubs or climbers, if leafless then with distinct nodes, long internodes and twining stems — 3

3 Climbers, twining round support — 4
Shrubs or decumbent or erect herbs, never twining — 24

4 Leafless fleshy-stemmed plants — 5
Plants with leaves; stems usually not fleshy — 6

5 Flowers over 5 mm long; corona double; petals erect — 25. *Sarcostemma*
Flowers less than 3 mm long; corona single; petals spreading or reflexed — 24. *Cynanchum tetrapterum*

6 Plants glabrous except for the corolla — 7
Plants hairy or at least pubescent on nodes and inflorescences — 8

7 Leaves linear; corolla with long hairs within — 9. *Periploca linearis*
Leaves broad-ovate or elliptic; corolla glabrous — 8. *Parquetina nigrescens*

8 Corona absent or obscure — 9
Corona present as conspicuous lobes on the staminal column, or between the petals and the staminal column — 12

9 Flowers yellow or orange, or combinations of these colours with green — 10
Flowers maroon or red, or at least with deep maroon centre to petals and corona — 31. *Tylophora* and 27. *Tylophoropsis*

10 Pedicels over 15 mm long, the flowers in loose cymes; petals over 6 mm long — 1. *Baseonema gregorii*
Pedicels less than 10 mm long, the flowers in small tight cymes or subumbellate; petals less than 5 mm long — 11

11 Leaves hairy, truncate or rounded at base; flowers in crowded, regular, pedunculate axillary umbels — 29. *Gymnema silvestre*
Leaves glabrous or hairy, always cuneate at base, sometimes broadly so; flowers in few-flowered, sometimes terminal cymes, rarely paniculate, rarely apparently umbellate but then leaves not hairy — 10. *Secamone*

12 Corona of simple, separate, entire, dorsally flattened lobes or filaments — 19

Corona of toothed lobes, fused laterally or flattened laterally or toothed below or terete, not dorsally flattened 13

13 Leaves cordate or hastate at base 14
Leaves cuneate to truncate at base 17

14 Corona with an inflexed bristle-like apex 22. *Pentarrhinum*
Corona with erect bristles or teeth at apex, or entire 15

15 Corona lobes free from each other 16
Corona lobes fused laterally 24. *Cynanchum*

16 Corolla maroon within, broadly bell-shaped; corona with no basal spur 12. *Oxystelma bornouense*
Corolla green with spreading, hardly fused lobes; corona with a basal spur directed downwards 26. *Pergularia daemia*

17 Flowers over 5 mm long; corona lobes massive, fleshy, terete, truncate above, as long as the staminal column 33. *Dregea abyssinica*
Flowers under 5 mm long; corona lobes laterally compressed, acute or rounded above, seldom as long as the staminal column 18

18 Leaves and stems uniformly pubescent; flowers fasciculate on short pedicels at nodes 28. *Diplostigma canescens*
Leaves and stems glabrous or glabrescent, pubescent only at nodes and on midrib; flowers in (often small) pedunculate cymes 10. *Secamone*

19 Leaves mostly crowded on lateral short shoots, lanceolate to oblanceolate 3. *Curroria volubilis*
Leaves not crowded on lateral short shoots, mostly ovate to elliptic 20

20 Corona lobes tomentose at apex 34. *Leptadenia hastata*
Corona lobes glabrous 21

21 Corona lobes shorter than or equalling the stamens, fused to the staminal column 22
Corona lobes much longer than the stamens, attached to the corolla 23

22 Petals pubescent within; corona forming pockets between petal lobes and joined to both staminal column and corolla tube 31. *Tylophora* sp. *B*
Petals glabrous or pubescent; corona attached to staminal column only, not forming pockets between corolla lobes 33. *Dregea* and 30. *Gongronema*

23 Leaves suborbicular in outline; corona lobes reaching only to two-thirds the length of the corolla 7. *Mondia ecornuta*
Leaves oblong to elliptic in outline; corona lobes equalling or exceeding the corolla 5. *Tacazzea*

24 Perennial herbs with annual stems arising from a woody or fleshy rootstock 31
Perennial shrubs with stems lasting more than one season, or annuals 25

25 Corolla lobes over 5 mm long 26
Corolla lobes less than 5 mm long 29

26 Corolla lobes tomentose along the margin towards the apex within; fruit not inflated 27
Corolla lobes glabrous within; fruit inflated 28

27 Leaves attenuate at base; corolla pure white; fruit smooth 19. *Kanahia laniflora*
Leaves truncate or subcordate at base; corolla green and purplish with yellow corona; fruit with soft prickles 13. *Xysmalobium undulatum*

28 Leaves sessile, clasping the stem at base; fruit smooth, rounded 18. *Calotropis procera*
Leaves petiolate, not clasping; fruit with soft prickles or pointed at apex 17. *Gomphocarpus*

29 Leaves pubescent on both surfaces, never more than 2·5 cm long; flowers in sessile fascicles 28. *Diplostigma canescens*
Leaves glabrous, at least above, usually over 2·5 cm long; flowers in pedunculate cymes or racemes 30

30 Roots with fleshy, globose tubers; leaves lanceolate; flowers apparently in racemes 2. *Sacleuxia tuberosa*
Roots without fleshy tubers; leaves elliptic; flowers in corymbose cymes 4. *Ectadiopsis oblongifolia*

31 Corona bigger than petals, spreading, dentate 23. *Margaretta rosea*
Corona smaller than petals, if spreading then entire 32

32 Petals linear, over 15 mm long 33
Petals broader, up to 15 mm long 34

33 Petal lobes parallel-sided, glabrous 35. *Tenaris rostrata*
Petal lobes narrowing gradually from the base, tomentose 37. *Brachystelma*

34 Corona of filamentous lobes attached to corolla 35
Corona broader, mostly attached to staminal column 36

35 Fascicles of flowers sessile; pollinia present; fruit tuberculate 11. *Glossonema revoilii*
Cymes pedunculate; pollen granular; fruit smooth 6. *Raphionacme madiensis*

36 Central staminal column (including stalk if present) ± cylindrical, as long as or longer than broad 37
Central staminal column sessile, disc-like, much broader than tall 40
37 Umbels sessile; corona lobes simple, globose or pear-shaped, each with an apical tooth 14. *Saxymolbium*
Umbels usually pedunculate; corona dorsally flattened, or with dorsally flattened lobes 38
38 Corona lobes 5, simple, not divided into secondary lobes, flat not chambered 13. *Xysmalobium undulatum*
Corona lobes apparently more than 5 by division, or lobed, or with a dorsal chamber 39
39 Flowers often bright red, sometimes green with white or yellow; corona lobes each enclosing a chamber 21. *Stathmostelma*
Flowers white, green and purple, not red or yellow; corona lobes each 2-lobed, the outer one usually overtopping the staminal column, not chambered 20. *Pachycarpus*
40 Flowers in terminal inflorescences 15. *Schizoglossum barbatum*
Flowers all axillary 41
41 Leaves oblong-elliptic, over 10 mm broad; petals maroon 32. *Sphaerocodon obtusifolium*
Leaves linear, less than 5 mm broad; petals greenish 42
42 Stems unbranched, erect 16. *Aspidoglossum*
Stems branched, inclined 37. *Brachystelma*
43 Stem cylindric, covered by contiguous fleshy truncate leaf bases in 6–10 rows; flowers small, less than 5 mm long 38. *Echidnopsis dammiana*
Stem angled, with the swollen leaf bases forming wings or bosses, not truncate, in 4–6 rows; flowers over 5 mm long 44
44 Stem bearing conical horny knobs; corolla with flat, spreading lobes from a short tube, exceeding 5 cm diameter 39. *Edithcolea grandis*
Stem with horny wings or unarmed; corolla with erect or bell-shaped corolla and lobes, always less than 5 cm in diameter 45
45 Flowers in small lateral umbels; corolla bell-shaped bearing teeth between the lobes; corolla lobes broader than long, with no vibrating hairs 41. *Huernia*
Flowers terminal or corolla lobes longer than broad, with vibrating hairs; corolla with no teeth between the lobes 40. *Caralluma*

1. BASEONEMA *Schltr. & Rendle*

Woody pubescent climbers with subsucculent stems; flowers in terminal long-pedicellate cymes; petals lobes spreading; corona absent; stamens with free filaments; anthers bearing granular pollen, adnate to the style above.

Baseonema gregorii *Schltr. & Rendle*

A climbing shrub with obovate to elliptic leaves; corolla lobes over 1 cm long, green, reflexed; fruit smooth, of two divergent velvety follicles.

Rare in dry *Commiphora* country. MAC, KAJ. Bally in EAH 7316.

2. SACLEUXIA *Baill.*

Shrubs with axillary, ± racemose inflorescences and tuberous roots; corolla with obconic tube at base, bearing membranous scales between the bases of the filaments; corolla lobes thick, triangular; corona obscure, of small fleshy lobes fused to the free filaments; stamens connate; pollen granular; follicles smooth.

Sacleuxia tuberosa (*Bruce*) *Bullock*

A pubescent shrub with many, sparsely-branched stems and narrow-lanceolate leaves; peduncles equalling or little longer than petioles, bearing usually 3 racemes of brownish flowers.

Locally common in dry rocky country around Suswa and Naivasha. RV.

Glover and Samuel 3309.

3. CURRORIA *Planch.*

Twiners with flowers in short racemes; corolla with spreading lobes and a glandular pad at the base of each lobe; corona of filiform lobes, inserted on the corolla between corolla lobes; stamens with free filaments; anthers bearing granular pollen, fused to the expanded stigma at their base, and connivent to each other at apex; stigma very obtusely conical, bearing spoon-shaped organs between the anthers.

Curroria volubilis (*Schltr.*) *Bullock*

A woody, thick-branched climber with most leaves on thick short shoots; leaves lanceolate to linear or oblanceolate, pubescent; flowers in few-flowered racemes, greenish-yellow with a brown centre.

Very rare plant found in dry country. MAG. Archer 527.

4. ECTADIOPSIS *Benth.*

Erect or twining shrubs with small flowers in cymes; petals shortly campanulate; corona of 5 filiform or fleshy lobes arising from the corolla

tube; stamens with free filaments and granular pollen; follicles smooth.

Ectadiopsis oblongifolia (*Meisn.*) *Schltr.* (see p.372)

An erect loose shrub with puberulent stem and glabrous, oblong-elliptic leaves; flowers pale yellow, in terminal or lateral corymbose cymes.

Common in wooded grassland in western Kenya, rarer in the east. KIT, KIS, EMB, MAC, KAJ.

Hanid and Kiniaruh 811; Faden 66214.

5. TACAZZEA *Decne.*

Similar to *Chlorocodon* except for the simple filiform corona lobes and the oblong petal lobes.

1 Leaves with raised reticulate venation below, cordate (occasionally only just) at base; flowers red; corona lobes twisted together above the stamens; follicles conical
1. *T. apiculata*

Leaves without a raised venation below, or only the midrib and primary nerves raised, rounded or broadly cuneate at base; flowers green and dull brown; corona lobes free above the stamens; follicles cylindrical
2. *T. galactogoga*

1. **Tacazzea apiculata** *Oliv.*

A climbing shrub with ovate to oblong leaves and large loose panicles of red flowers.

Common along the Athi river, rare in upland and riverine forests elsewhere. HA, NAR, MAC, NBI.

Verdcourt 1570; Agnew 8230.

2. **Tacazzea galactogoga** *Bullock*

A climbing shrub with broad-elliptic, glabrous or tomentose leaves and large loose panicles of green flowers.

Locally common in upland rain-forest. HM, HA, HN, KAJ.

Agnew and Haines 8235; Bally 7924.

6. RAPHIONACME *Harv.*

Herbs from a tuberous rootstock with small flowers in pedunculate cymes; petal lobes spreading with a short cylindrical tube at base; corona of 5 entire or divided lobes attached to the corolla tube at the insertion of the filaments; filaments free; stamens with granular pollen; follicles smooth.

1 Leaves elliptic; flowers in axillary cymes
1. *R. madiensis*

Leaves linear; flowers in terminal cymes or racemes
2. *R. splendens*

1. **Raphionacme madiensis** *S. Moore* (see p. 371)

An erect branching perennial with elliptic, often undulate leaves overtopping the axillary cymes of numerous green and purple-brown flowers.

Recorded by Mrs E. M. Tweedie from Mt. Elgon. HE.

2. **Raphionacme splendens** *Schlechter*

An erect herb from a fleshy tuber with ± unbranched stems and linear leaves; flowers few or up to 10 in loose terminal cymes or racemes, white and magenta.

Rare plant found in grassland; recorded once from Langata. NBI.

Archer 127.

7. MONDIA *R. Skeels*

Woody climbing shrubs with well-developed stipular frills at nodes and axillary panicles of flowers; corolla lobes spreading, almost free; corona of broad lobes, each often 3-lobed, the centre one (in ours) filiform; stamens with free filaments and granular pollen; style conical, not exceeding the anthers.

Mondia ecornuta (*N. E. Br.*) *Bullock*

Sparsely pubescent climbing shrub with sub-orbicular, cordate, abruptly acuminate leaves; flowers red-purple or maroon, to 14 mm long.

Rare plant found in wet western Kenya forests and only collected from Kakamega. MUM.

Dale 3431.

8. PARQUETINA *Baill.*

Similar to *Periploca*, but the corolla lobes auriculate at apex and with the corona usually divided above.

Parquetina nigrescens (*Afz.*) *Bullock*

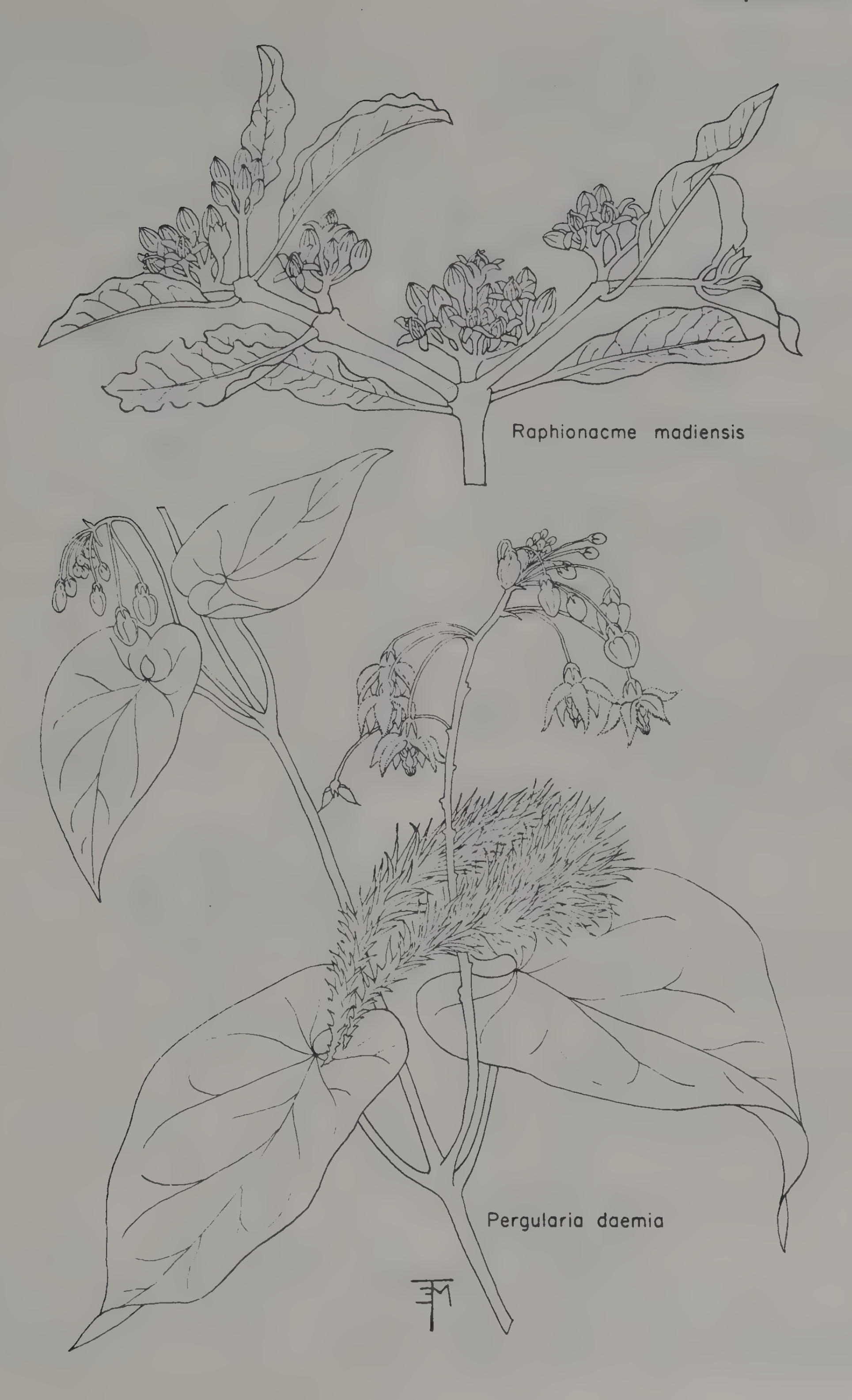
A glabrous woody climber with elliptic to oblong to suborbicular leaves, rounded or sub-cordate at base and apex; flowers large (over 8 mm long) in few-flowered axillary corymbs, purple-brown.

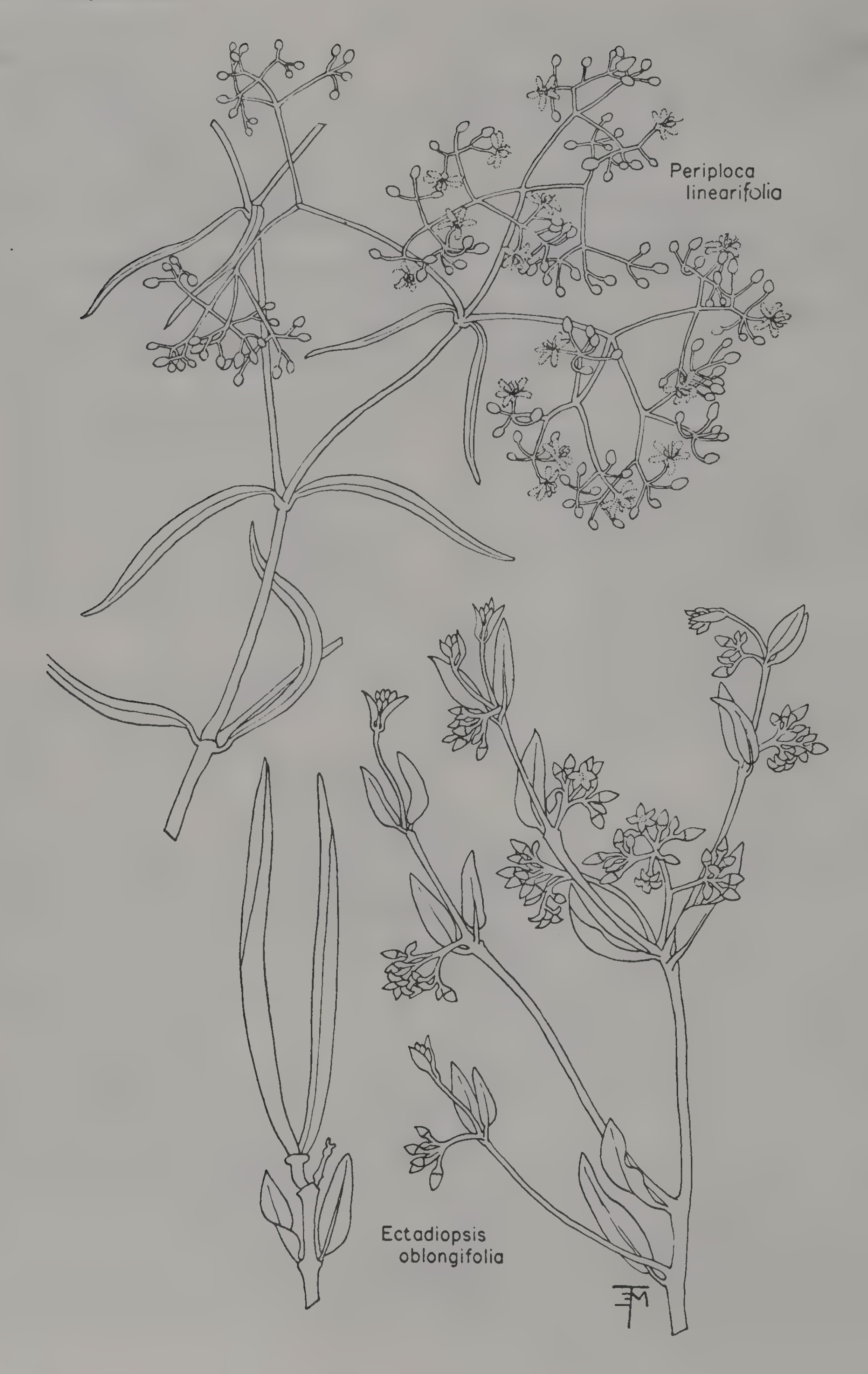
Rare plant found in riverine forest in hot country and only known from Kibwezi in our area. KAJ.

Verdcourt 3187.

9. PERIPLOCA *L.*

Erect or climbing, glabrous shrubs, with or without leaves; flowers in corymbs; corolla lobes spreading, longer than the tube; corona of 5 filiform lobes arising from the corolla between the petals; stamens with free filaments, anthers bearing granular pollen loosely coherent with style; style shorter than anthers; follicles smooth.


Raphionacme madiensis
Pergularia daemia


Periploca
linearifolia
Ectadiopsis
oblongifolia

Periploca linearifolia *Dill. & Rich.* (see p. 372)

A woody climber with linear leaves and terminal corymbs or purple and white flowers; petals white with a purple line above, hairy; corona lobes connivent at apex, forming a 'lantern' above the stamens.

Common in upland forest edges, but seldom flowering. HE, HC, HT, HM, HA, KIT, KIS, NAR, RV.

Agnew and Beecher 8272; Mwangangi 75.

10. SECAMONE *R. Br.*

Climbing shrubs with rounded or cuneate leaf-bases and rather small, stiff leaves; flowers in few-flowered cymes, which may be isolated, axillary or in branching terminal inflorescences, always (in ours) orange or yellow; petal-lobes spreading or erect, rather thick; corona obscure of 5 laterally-flattened lobes on the staminal column; stamens fused into a column, the pollen in 3–4 minute loose masses in each anther; follicles smooth.

1 Stigma exceeding anthers by more than the diameter of the style, usually visibly expanded above the anthers — 2
  Stigma level with the top of the anthers or not exceeding the anthers by more than the diameter of the style, and not expanded above — 4
2 Anthers hairy; stigma club-shaped or spherical — 1. *S. africana*
  Anthers glabrous — 3
3 Leaves softly tomentose, ovate-elliptic; stigma shortly obconical, as long as broad — 2. *S. stuhlmannii*
  Leaves glabrous except on midrib and margin, coriaceous, linear-lanceolate; stigma long-obconical, longer than broad — 3. *S. punctulata*
4 Apex of corona lobe acute, incurved, reaching nearly to apex of staminal column — 5
  Apex of corona lobe held below middle of staminal column, obtuse, rounded — 4. *S.* sp. *A*
5 Leaves lanceolate-linear, abruptly narrowed or rounded at base — 5. *S. parvifolia*
  Leaves ovate-elliptic, ± attenuate at base — 3. *S. punctulata*

1. Secamone africana *(Oliv.) Bullock*

A woody sparsely pubescent climber with elliptic leaves; flowers cream-coloured, rather large (over 4 mm long), in terminal panicles.

Rare plant found in western Kenya. MUM, KIS.
Napier 2931: Dekker 3.

2. Secamone stuhlmannii *K. Schum.*

A woody softly tomentose climber with elliptic leaves and yellow flowers in small, lateral cymes.

Rare plant found in the Mara area only. NAR.
Verdcourt and Darling 2287.

3. Secamone punctulata *Decne.*

A woody sparsely pubescent climber with narrowly elliptic or linear leaves and flowers in small axillary cymes; corona rounded, below the middle of the staminal column.

Our commonest *Secamone*, found in dry evergreen woodland. HA, NAR, MAC, KAJ.
Gardner 1389; Agnew 8798.

4. Secamone *sp.* **A.**

Climbing shrub similar to *S. punctulata* except for the linear leaves and terminal cymes; corona with an acute tip held above the centre of the staminal column; stigma not overtopping anthers.

In dry country in rocky soils. Not yet recorded for our area, this species is included as it will probably be found in the future.
Known from East Tsavo.
Archer 213.

5. Secamone parvifolia *(Oliv.) Bullock*

A woody sparsely pubescent climber with ovate-elliptic leaves and axillary and terminal few-flowered cymes of small flowers.

A rare species of dry bushland, with broad leaves which appear to be undulate at margin when dry, and may be so when fresh. Again, this species is known from only just outside our area at Kiboko and at Mwingi in MAC.
Edwards 85.

11. GLOSSONEMA *Decne.*

Small annual or perennial herbs with flowers in axillary cymes; corolla tube short; corona of 5 lobes arising from the corolla, stamens fused; pollinia pendulous; follicles tuberculate or smooth.

Glossonema revoilii *Franch.*

An erect, pubescent, much-branched perennial herb from a thin woody rootstock, with oblong-elliptic leaves; cymes sessile; flowers cream-yellow with maroon centre, fading to bronze; follicles tuberculate.

Uncommon plant found in dry rocky bushland, MAG, NAN, MAC, KAJ.
Agnew 7300; Archer 532.

12. OXYSTELMA *R. Br.*

Climbers with few-flowered pedunculate cymes or racemes; corolla with a short tube, broadly saucer-shaped and 5-lobed above; corona of 5

erect, fleshy, lanceolate lobes attached to the staminal column; stamens fused; anthers with pendulous pollinia; follicles inflated.

Oxystelma bornouense *R. Br.*

A glabrescent climber with cordate leaves and big maroon and white flowers to 3 cm diameter.

Rare plant found in riverine forest and only recorded from the Athi River in our area. MAC.

Ranwell 3163.

13. XYSMALOBIUM *R. Br.*

Erect herbs with usually unbranched stems and tuberous roots; umbels pedunculate or sessile; corolla lobes divided nearly to base, spreading, ovate-triangular, pubescent or glabrous; corona of 5 lobes, arising from the base of the corolla tube, each lobe flattened, fleshy, ± fused to other lobes laterally at base; pollinia pendulous; staminal appendages conspicuous; fruit softly spiny or smooth.

Xysmalobium undulatum (*L.*) *Ait. f.* (see p. 375)

A robust erect annual or perennial, unbranched, with lanceolate undulate leaves which are truncate or even clasping at the base; flowers brown-purple; fruits densely covered with soft spines.

Common in marshy grassland especially in Western Kenya. KIT, NAN, KAJ.

Rodgers 489; Tweedie 67/216.

14. SAXYMOLBIUM *Bullock* ined.

Similar to *Xysmalobium* but the umbels sessile, petals reflexed and corona lobes attached to the staminal column, each lobe consisting of a ± globose base with a short, papillose point above.

1 Leaves oblong, obtuse 1. *S. heudelotianum*
  Leaves linear, acute 2. *S.* sp. *A*

1. Saxymolbium heudelotianum (*Decne.*) *Bullock* (*Xysmalobium reticulatum* N. E. Br.) (see p. 375)

Herb with erect unbranched stems bearing oblong, glabrescent leaves and sessile umbels of flowers; petals green, corona brown.

Uncommon plant found in grassland in western Kenya. HT, HA, KIT.

Bickford, April 1948.

2. Saxymolbium *sp.* A.

Similar to *S. heudelotianum* but with very narrow-linear, acute leaves.

Only once collected, on the Chyulu Hills. KAJ.

Archer 543.

15. SCHIZOGLOSSUM *E. Mey.*

Similar to *Xysmalobium* but with an apical or inner horn or points on the corona and with the staminal mass short, disc-like; corolla lobes ovate, glabrous within.

Schizoglossum barbatum *Brit. & Rendle*

An erect pubescent herb with linear leaves and axillary and terminal corymbs of maroon and green flowers; corona hooded, with an apical filamentous point and lateral obtuse lobes.

Rare plant found in highland grassland in Western Kenya. HT, HM.

Polhill 395.

16. ASPIDOGLOSSUM *E. Mey.*

Similar to *Schizoglossum* but having an erect, unbranched stem, axillary (not terminal) inflorescences, linear leaves and narrower, often hairy petals.

1 Petals less than 3 mm long 1. *A. interruptum*
  Petals more than 3 mm long 2
2 Petals connate at tip, glabrous or uniformly pubescent within, over 7 mm long; corona lobes truncate, usually without an apical point 2. *A. connatum*
  Petals free at tip, glabrous or usually pubescent, with an apical tuft of long hairs; corona lobes truncate, with an apical point on the inside 3. *A. angustissimum*

1. Aspidoglossum interruptum (*E. Mey.*) *Bullock*

An erect, unbranched, pubescent herb from a narrow tuber with linear, revolute leaves and small clusters of brownish flowers in the upper axils.

Rare plant found in dry grassland. BAR.

Dale 6960.

2. Aspidoglossum connatum (*N. E. Br.*) *Bullock*

Similar to *A. interruptum* except for the flowers which are larger (to 9 mm long) with connate petals and subentire corona.

Rare plant found in dry grassland in western Kenya. HT, MUM, RV.

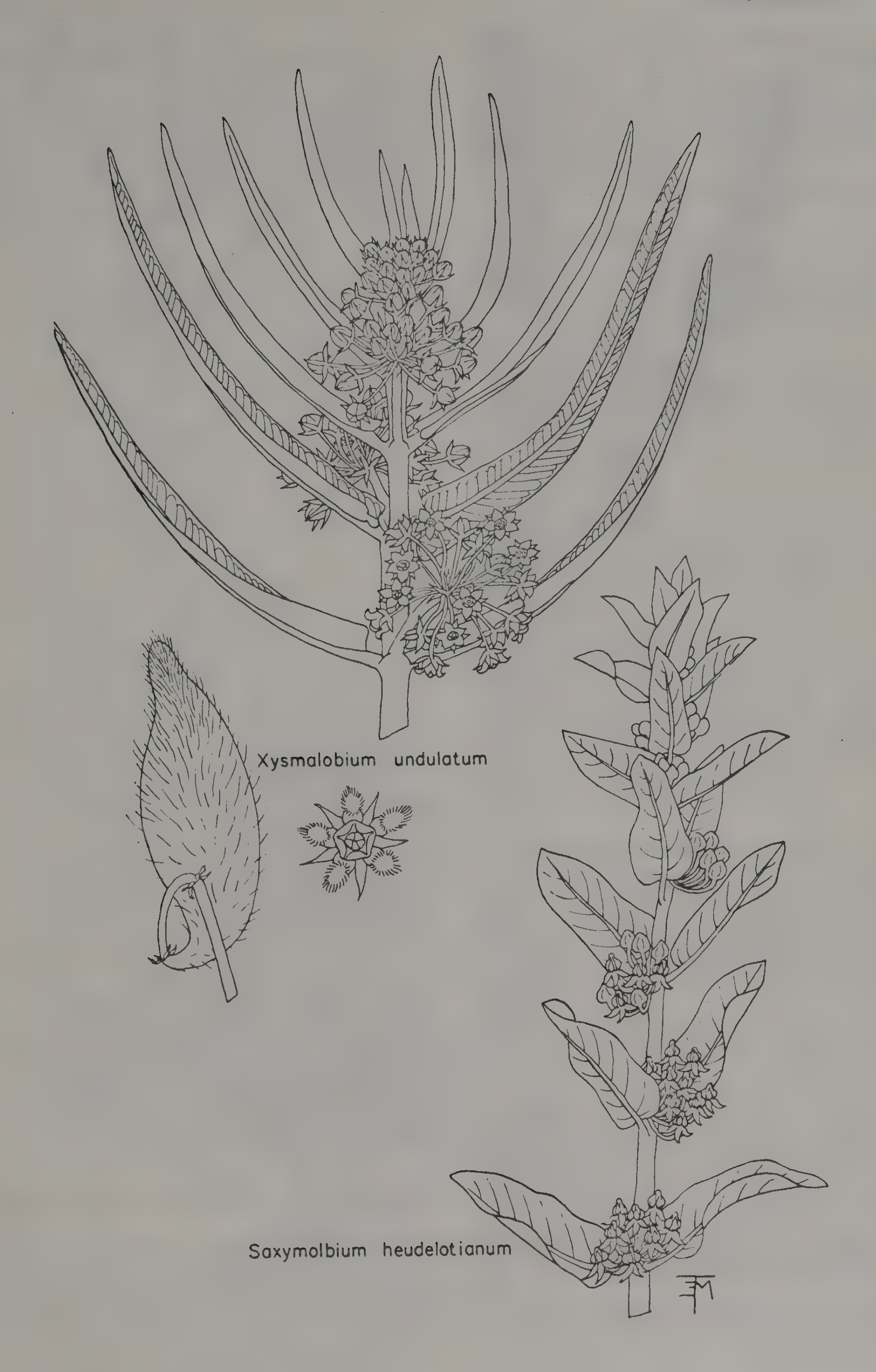
Napier 2915.

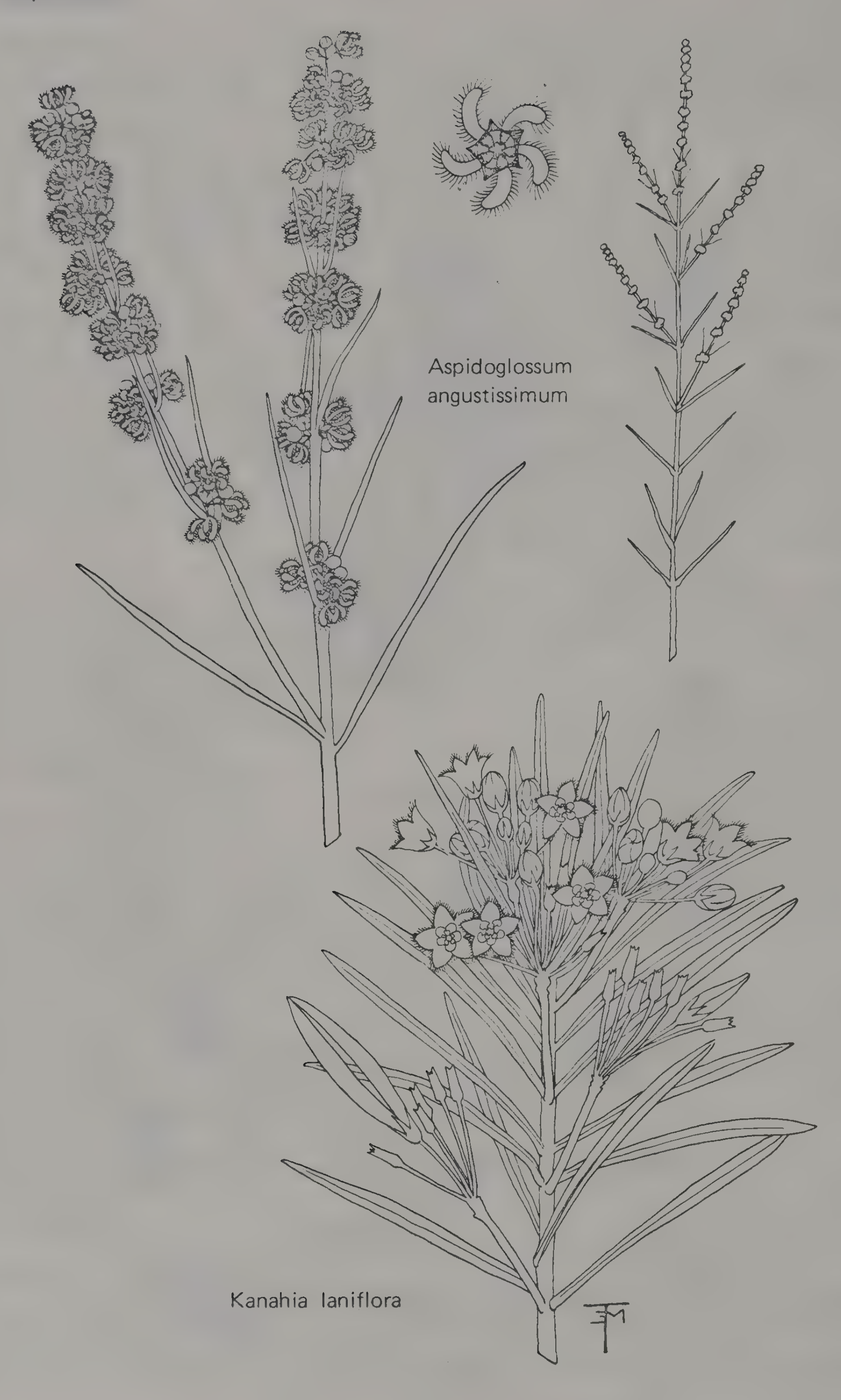
3. Aspidoglossum angustissimum (*K. Schum.*) *Bullock* (see p. 376)

Similar to the last two species except for the characters given in the key; petals vary in the amount of indumentum they bear.

Fairly common in dry grassland around Nairobi and also found elsewhere. HC, HA, KIT, RV, NAN, NBI.

Agnew and Barnley 10577; Williams in EAH 12335.


Xysmalobium undulatum
Saxymolbium heudelotianum


Aspidoglossum
angustissimum
Kanahia laniflora

17. GOMPHOCARPUS *R. Br.*

Erect perennials from a simple, unthickened root, with linear to lanceolate, often whorled or alternate leaves; flowers in pedunculate lateral umbels; corolla spreading or reflexed, lobed nearly to base; corona attached to the base of the stalked staminal column, of infolded lobes usually toothed on the inner angles of the lobes and hollow within; stamens fused; pollinia pendulous; follicles inflated, often bristly.

1 Corona lobes with a tooth on each of the inner angles, the tooth directed outwards and often curved downwards — 2
Corona lobes with erect or obscure teeth on the inner angles — 4
2 Leaves with raised lateral veins below; corona overtopped by staminal column; inner angle of corona lobes crenate, the outwardly directed part shorter than the entire tooth — 1. *G. semilunatus*
Leaves with obscure or invisible lateral veins below; corona equalling staminal column; inner angle of corona lobes consisting wholly of the recurved part with or without a minute inner tooth — 3
3 Corona with a small erect appendage within the shallow central hollow; fruits obtuse apiculate at apex — 2. *G. kaessneri*
Corona with no appendage within the deeper central hollow; fruits tapering gradually to an acute apex — 3. *G. fruticosus*
4 Leaves over 5 mm broad, lanceolate-linear, with visible lateral venation below; corona overtopped by staminal column; fruits with scattered bristles over entire surface — 4. *G. physocarpus*
Leaves less than 5 mm broad, acicular with invisible lateral venation below; corona equalling or overtopping the staminal column; fruits smooth or with a few bristles in 1–2 lines only — 5
5 Corona lobes lanceolate in lateral outline, overtopping the staminal column, crenate but not toothed on the inner angle; fruits ovate, acuminate in outline — 5. *G. integer*
Corona lobes suborbicular in lateral outline, equalling the staminal column, with 1–2 small teeth on inner angle; fruits lanceolate, acute in outline — 6. *G. stenophyllus*

1. Gomphocarpus semilunatus *A. Rich.* (see p. 378)

A large erect perennial with crowded lanceolate leaves and purple-pink flowers; corona mostly with an erect tooth within the central hollow; fruits pubescent, ± semicircular in lateral outline, equally rounded at both ends, thickly covered with minutely scabrid bristles.

One of the commonest species in Kenya, especially in the west, growing in disturbed places and on flooded grassland and roadsides in medium altitude grassland areas. HE, HT, HM, HA, KIT, MUM, KIS, NAR, RV.

Agnew, Kibe, and Mathenge 10610; Lucas 115.

2. Gomphocarpus kaessneri *N. E. Br.*

Similar to *G. semilunatus* except for the corona which has a shallow hollow above with a short appendage in it and large recurved lobes on the inner angles; fruit tomentose with spreading-pubescent bristles.

This species replaces *G. semilunatus* in the eastern part of our area. MUM, RV, MAG, MAC, NBI, KAJ.

Greenway 9691; Harmsen 6479; Kaessner 664 (Type).

3. Gomphocarpus fruticosus (*L.*) *Ait. f.* (see p. 379)

A branched erect shrub, with acicular to linear-oblong leaves and white and maroon flowers; fruits ovate in outline, covered with almost glabrous purple bristles.

This species has consistently shorter leaves (usually to 8 cm long) than *G. physocarpus*, with which its fruits may be confused. It is our commonest species of *Gomphocarpus* and can be found in dry montane grassland and along water-courses in lowland country. HC, HT, HM, HL, HA, HK, KIT, KIS, BAR, RV, EMB, KAJ.

Moreau 48: Part II Botany 90.

4. Gomphocarpus physocarpus *E. Mey.* (see p. 379)

A sparsely branched erect shrub with lanceolate leaves and green and white flowers, occasionally tinged with purple; fruit broadly ovate in outline, rather abruptly constricted into a short ± hooked apex, covered with scattered minutely pubescent bristles.

Uncommon plant found in dry upland grassland. HT, HM, HA, NAR.

Lind, Agnew, and Harris 5101; Napier 5065.

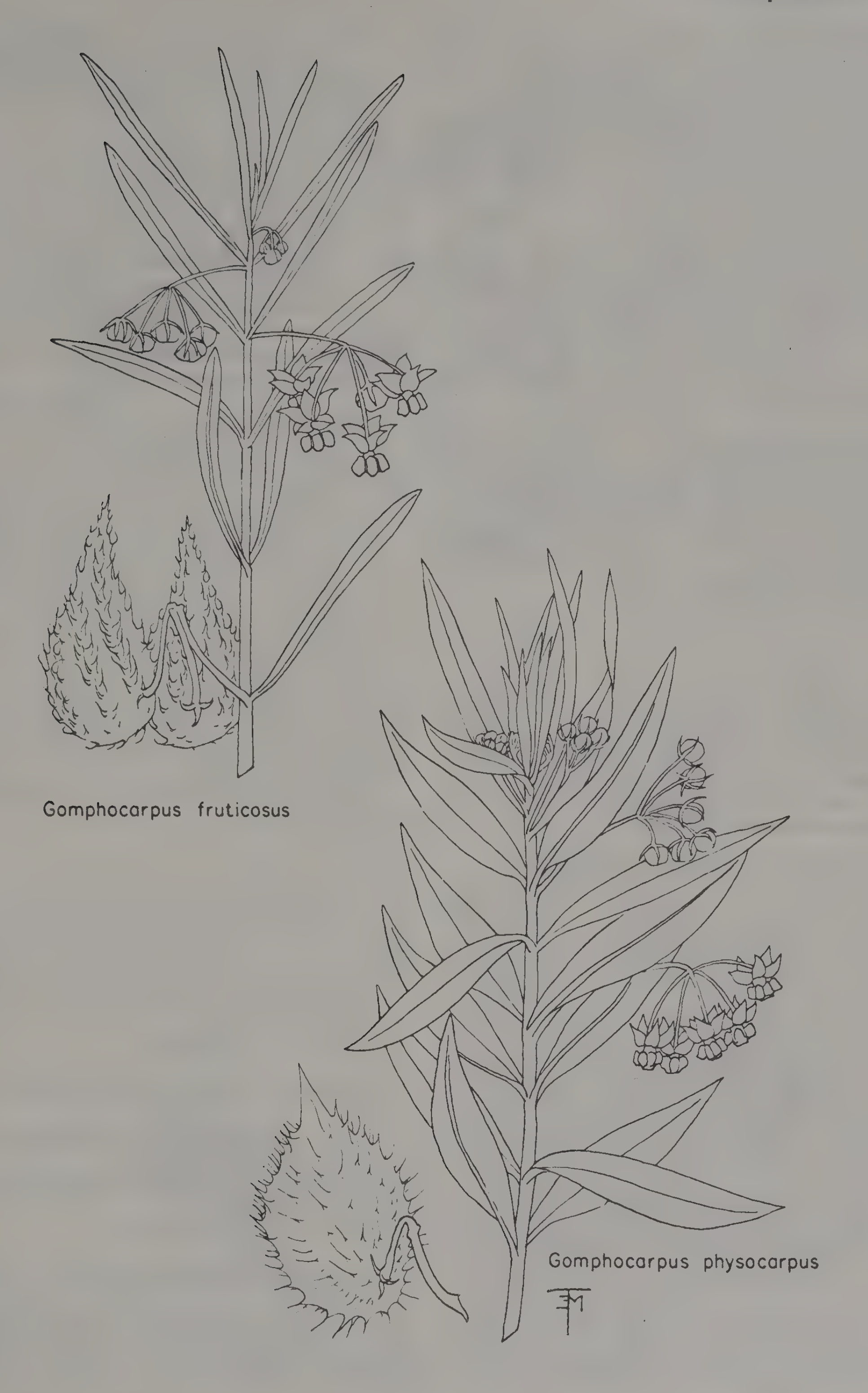
5. Gomphocarpus integer (*N. E. Br.*) *Bullock*

A delicate erect sparsely-branched perennial with white woolly hairs on young parts and acicular leaves; flowers yellow, green and pink; fruits ovate-acuminate in outline, with a few glabrous bristles along one side or smooth.

Locally common in grassland at medium altitudes. HA, KIS, NAR, BAR, RV, NAN, MAC, NBI.

Agnew and Gilbert 7808; Turner in EAH 6900.


Gomphocarpus
stenophyllus
Gomphocarpus
semilunatus


Gomphocarpus fruticosus
Gomphocarpus physocarpus

6. Gomphocarpus stenophyllus *Oliv.* (see p. 378)
Similar to *G. integer* but with yellow or reddish flowers and a narrower, usually smooth, fruit.
Locally common in dry grassland at medium altitudes, often on disturbed or rocky soils. HE, HT, HM, HA, KIT, NAR, NAN, MAC, NBI, KAJ.
Strid 2646; Glover 273.

18. CALOTROPIS *R. Br.*
Erect shrubs with clasping leaves and dense axillary umbels of large flowers; corolla shortly saucer-shaped at base, with triangular-ovate lobes; corona of 5 compressed lobes, with 2 apical teeth and an upcurved spur at base arising from the staminal column; anthers fused; pollinia pendulous; follicles inflated, smooth.

Calotropis procera (*Ait.*) *Ait. f.*
A tall, softly woody, sparingly-branched shrub with elliptical or ovate clasping leaves and dense masses of purple, violet and white flowers.
Common in disturbed places, especially where seasonally flooded, in dry country. MUM, KIS, BAR, MAG, EMB, MAC, KAJ.
Greenway 10396; Agnew 10759.

19. KANAHIA *R. Br.*
Shrubs with unbranched stems and linear-lanceolate leaves; flowers in lateral pedunculate cymes; corolla deeply 5-lobed; corona of 5 lobes arising from staminal column, each lobe folded and thus with a central chamber, or fused into a single mass, with two apical teeth; stamens fused; pollinia pendulous; fruits smooth.

Kanahia laniflora (*Forsk.*) *R. Br.* (see p. 376)
A glabrous shrub with many erect stems and linear leaves; flowers large, pure white.
Locally abundant along watercourses in dry country. BAR, NAN, MAC.
Agnew 9948; Ossent 281.

20. PACHYCARPUS *E. Mey.*
Herbs with one (or few) erect, unbranched stems from a perennial, often tuberous, rootstock; leaves often broad, cordate or truncate at base; flowers in pedunculate axillary umbels; corolla lobes broad-ovate, shortly fused at base; corona inserted below the anthers on the stalked staminal column, consisting of 5 free segments each of two parts, an outer often dorsally-flattened lobe joined to two inner often laterally-flattened lobes; stamens fused; pollinia pendulous; fruits smooth, often winged.

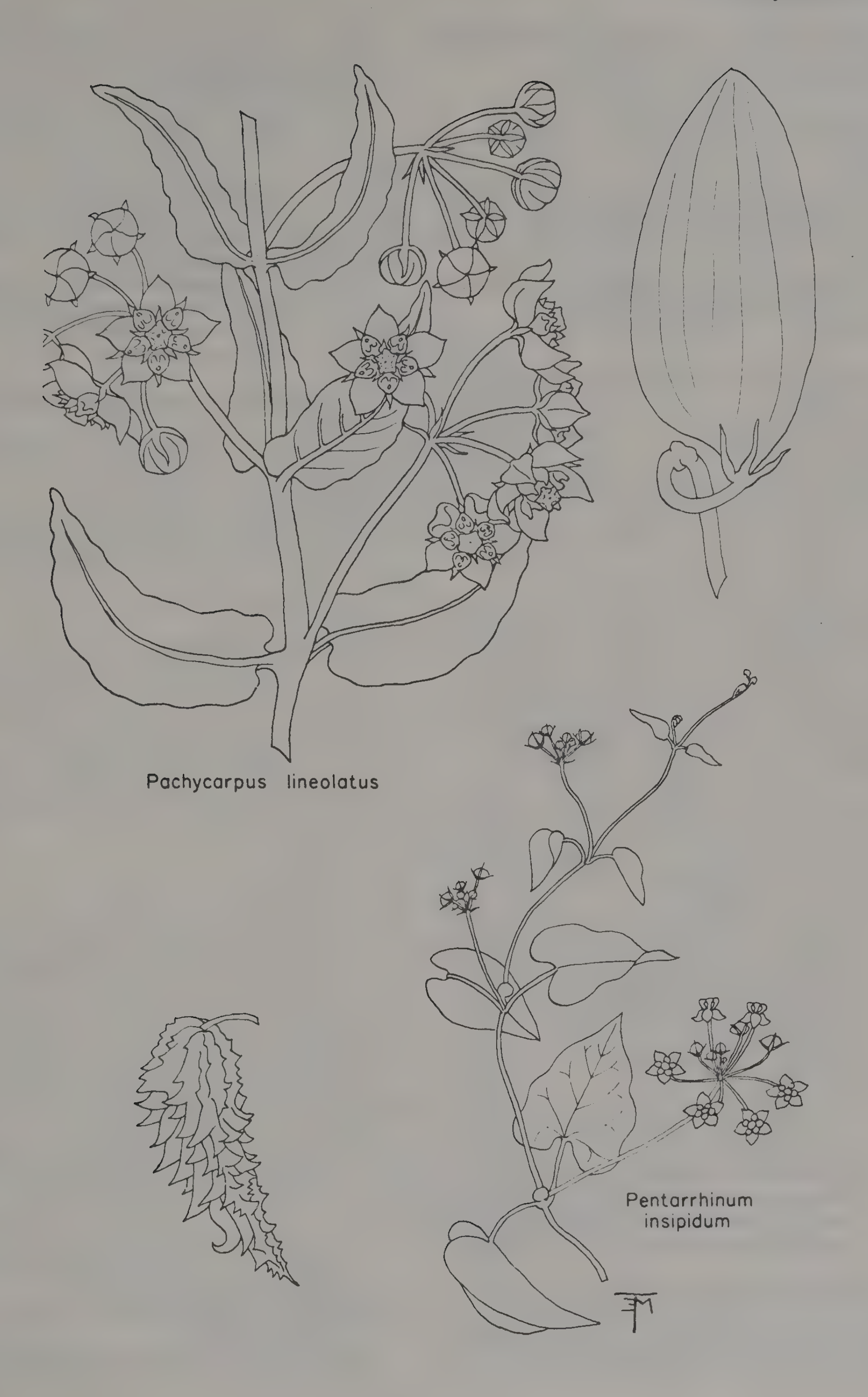
1 Outer lobe of each corona segment equal to or longer than inner lobes — 2
Outer lobe of each corona segment obscure, much shorter than inner lobes — 1. *P. fulvus*
2 Inner lobes of corona consisting of erect, conical or linear, ± acute projections — 3
Inner lobes of corona consisting of broad obtuse lobes — 4
3 Leaves mostly lanceolate-ovate without a well-marked submarginal vein; inner corona lobes filamentous arising near the base of the corona — 2. *P. grantii*
Leaves mostly oblong-elliptic, with a well-marked submarginal vein; inner corona lobes reduced to a pair of teeth arising nearly on a level with top of stamens — 3. *P. eximius*
4 Leaves linear-lanceolate; outer corona lobe twice as long as inner lobes — 4. *P. rhinophyllus*
Leaves oblong-ovate to lanceolate; outer corona as long as inner corona — 5
5 Corona lobes overtopped by the staminal column, and inserted on the stalk of that column which is ± as long as the anthers; leaves lanceolate-oblong — 5. *P. lineolatus*
Corona lobes equalling the staminal column; stalk of staminal column ± half as long as anthers; leaves oblong-ovate — 6. *P. schweinfurthii*

1. Pachycarpus fulvus (*N. E. Br.*) *Bullock*
An erect pubescent perennial with ovate to oblong ± cordate leaves and striking umbels of cream, orange and brown flowers.
Rare plant found in western Kenya in wooded grassland. HE, KIT.
Tweedie 56.

2. Pachycarpus grantii (*Oliv.*) *Bullock*
An erect pubescent perennial with ovate, lanceolate or oblong leaves which are scabrid along the margin, and with conspicuous (sometimes sessile) umbels of white and maroon or purple flowers.
Uncommon plant found in dry upland grassland. HC, HT, HA, HK.
Strid 2632A; Graham 857.

3. Pachycarpus eximius (*N. E. Br.*) *Bullock* (see p. 383)
Similar to *P. grantii* except for the broader leaves and shorter inner corona teeth.
Uncommon plant found in western Kenya. HE, HC, KIT, MUM, KIS.
Glasgow 46/23; Lugard 570.

4. Pachycarpus rhinophyllus (*K. Schum.*) *N. E. Br.*
An erect pubescent perennial from a tuberous root system with lanceolate-linear leaves which are truncate at base; flowers in (sometimes sessile) umbels, yellow and brown.


Pachycarpus lineolatus
Pentarrhinum insipidum

Locally common in grassland from 5000–7000 ft. HA, HK, NAR, MAC, NBI, KAJ.
Agnew 7470; Glover 653.

5. Pachycarpus lineolatus (*Decne.*) Bullock (see p. 381)
Similar to *P. rhinophyllus* except for the broader, more oblong leaves with a scabrid edge, and the key characters; flowers greenish with purplish corona.
Rare plant found in grassland in western Kenya and also found at the coast. HE, MUM.
Jack 305.

6. Pachycarpus schweinfurthii (*N. E. Br.*) *Bullock* (see p. 383)
Similar to the last species in all respects except for the key characters.
Locally common, in dry wooded grassland. HE, HC, KIT, MUM, KIS, EMB, KAJ.
Hanid and Kiniaruh 798; Webster 8830.

21. STATHMOSTELMA *K. Schum.*

Perennial herbs from a fusiform tuber, with erect, dichotomous stems and terminal umbels of showy flowers; leaves linear; corolla lobes shortly fused at base, ovate; corona of 5 lobes arising at the base of the staminal column which is short-stalked, each lobe folded to enclose a chamber from which a protuberance usually arises; stamens fused; pollinia pendulous.

1 Petals white; flowers over 3 cm in diameter — 1. *S. praetermissa*
  Petals red or olive-green; flowers less than 3 cm in diameter — 2
2 Corona lobes ± truncate above, the inner angles held at the same level as the outer edge; central protuberance of corona not exceeding the top of the corona — 3
  Corona lobes lobed above, the inner angles produced to greatly overtop the outer edge which is also overtopped by the filiform central protuberance — 2. *S. rhacodes*
3 Corona lobes almost solid, the central protuberance acute, lying between the two inner edges — 3. *S. pedunculata*
  Corona lobes almost completely hollow, with the central protuberance arising from the back of the hollow and ending obtusely between the inner edges — 4. *S. propinqua*

1. Stathmostelma praetermissa *Bullock*
A robust erect branched herb with sparsely pubescent linear leaves and large white, green and dull purple flowers in many umbels.
Rare plant found in wooded grassland in Machakos district. MAC.
Verdcourt 844.

2. Stathmostelma rhacodes *K. Schum.* (see p. 366)
An erect, sparsely-branched herb with linear, glabrous leaves and usually only one terminal umbel, with some pedicels usually less than 4 cm long, of red and orange flowers.
Common in seasonally wet or waterlogged grassland especially on shallow soil. HT, HM, HA, KIT, KIS, NAR, BAR, RV, MAC, NBI.
Strid 3155; Glover 1643.

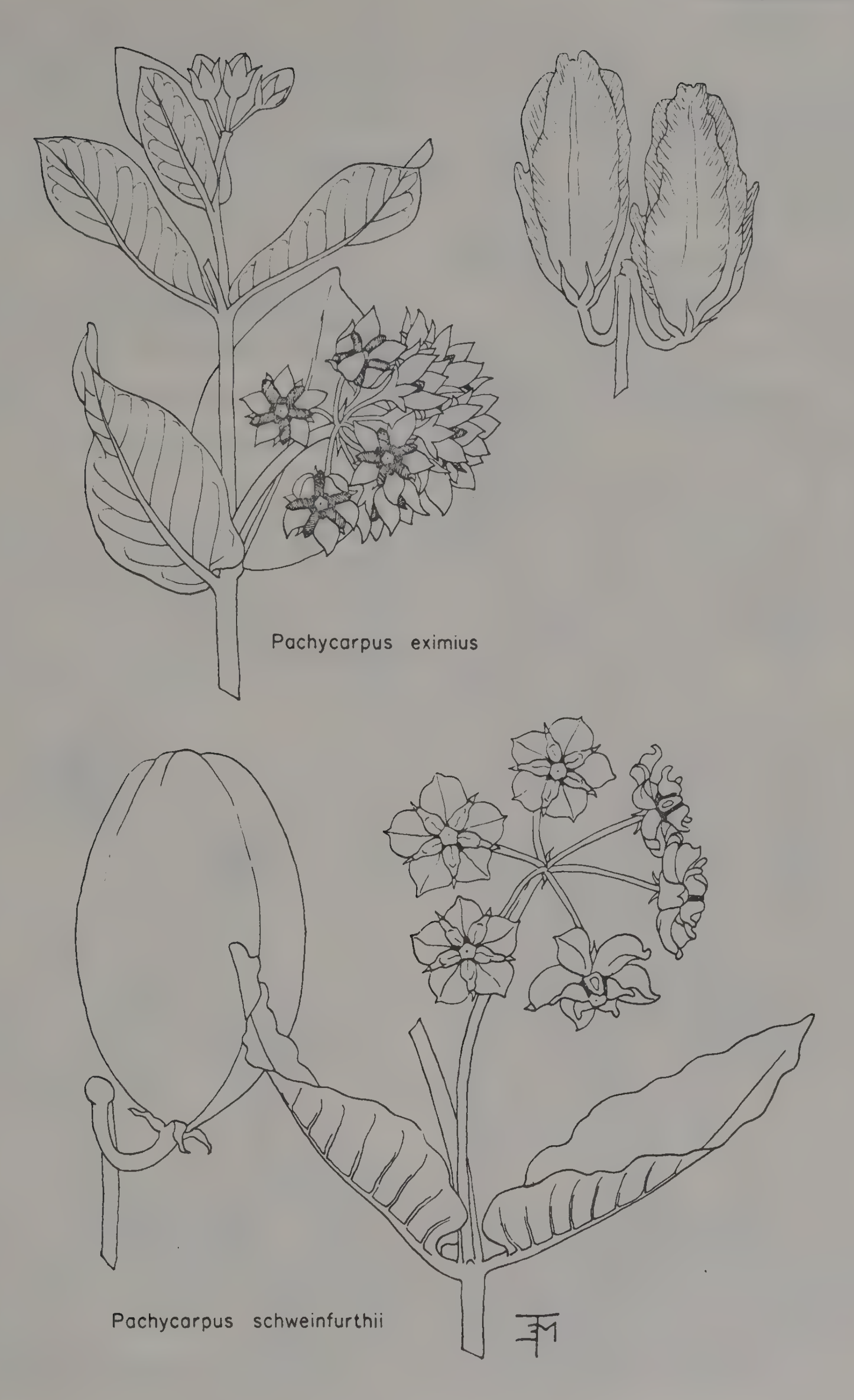
3. Stathmostelma pedunculata (*Decne.*) *K. Schum.*
Very similar to *S. rhacodes* except for the key characters and the usually longer (over 5 cm) pedicels and larger flowers.
Common in some areas of sandy grassland as well as on black-cotton soil, often on shallow soils, and abundant at the coast. HE, HL, KIT, EMB, MAC, NBI.
Agnew and Hanid 7520; Napier 3048.

4. Stathmostelma propinqua *N. E. Br.*
A low repeatedly-dichotomous herb with linear pubescent leaves and several few-flowered umbels of green and dull purple flowers.
This rare plant has been found in grassland locally near Nairobi (Langata) and once elsewhere (Isiolo). It was described from Tanzania, near Kilimanjaro. NAN, NBI.
Archer 185.

22. PENTARRHINUM *E. Mey.*

Climbing herbs or weak shrubs with cordate leaves and no stipules; flowers in axillary, pedunculate racemes, corymbose or almost umbellate; corolla deeply 5-lobed, the lobes spreading or reflexed; corona of 5 lobes alternating with the petals, shortly fused at base, each lobe obconical with an adaxial groove, expanded at the top and with an inflexed filamentous apex; stamens united with pendulous pollinia; follicles usually rugose.

1 Corona-lobes yellow (at anthesis), apparently solid, ending in a sharp-edged disc with an inflexed central apical appendage — 1. *P. insipidum*
  Corona-lobes white (at anthesis), hollow, folded and rounded at the apex into the inflexed apical appendage — 2
2 Leaves abruptly acuminate at apex; petals with red venation — 2. *P.* sp. *A*
  Leaves acute at apex; petals simply green — 3. *P. abyssinicum*


Pachycarpus eximius
Pachycarpus schweinfurthii


Dregea schimperi
Margaretta rosea
Leptadenia hastata

1. Pentarrhinum insipidum *E. Mey.* (see p. 381)

Sparsely pubescent climber with glabrescent, suborbicular cordate leaves; peduncles of racemes usually longer than petioles; petals green; corona yellow or orange; fruit warty.

Fairly common in dry country and edges of dry evergreen forest. HM, HA, MUM, KIS, RV, MAG, MAC, NBI, KAJ.

Kokwaro 111; Strid 2740.

2. Pentarrhinum *sp.* **A.**

Similar to *P. insipidum* except for the slightly more hairy ovate, cordate and acuminate leaves and the corolla and corona characters mentioned in the key.

Apparently rare plant found in upland forest edges. HC, HA.

Webster 8829; Polhill 457; Agnew and Beecher 8273.

3. Pentarrhinum abyssinicum *Decne.* (see p. 366)

Similar to *P.* sp. *A.* except for its smaller leaves which are densely tomentose above and below and not acuminate, and the peduncles which are usually shorter than the petioles; corolla and corona characters as in the key.

Locally common in grassland and *Combretum* woodland. MAG, MAC, KAJ.

Archer 91; Tweedie 67/122.

23. MARGARETTA *Oliv.*

Erect herbs from a tuberous rootstock; inflorescences terminal, of corymbose cymes; corolla small, spreading, deeply lobed; corona of 5 lobes arising from staminal column, each lobe with a folded claw at base bearing 2–3 teeth above and an expanded petaloid blade; stamens fused; pollinia pendulous; follicles smooth.

Margaretta rosea *Oliv.* (see p. 384)

An erect pubescent herb with lanceolate to linear leaves and dense terminal masses of pink, orange or yellow flowers.

Common in grasslands of Western Kenya. HE, HA, KIT, KIS.

Tweedie 67/18; Harger 5.

24. CYNANCHUM *L.*

Erect or climbing, glabrous or hairy herbs or shrubs with cordate to cuneate leaf bases; corolla with the tube shorter than the lobes; corona continuous within the corolla, toothed or laciniate, often with secondary lobes and teeth arising within the primary ones; stamens fused, with pendulous pollinia; style shorter or longer than stamens.

1 Leafless fleshy climbers — 1. *C. tetrapterum*
  Leafy climbers or fleshy trailing shrubs — 2
2 At least some leaves hastate or cordate at base — 3
  All leaves rounded at base — 2. *C. altiscandens*
3 Leaves white-tomentose below; petals hairy; corona-lobes longer than the corona tube — 3. *C. abyssinicum*
  Leaves glabrous or sparsely pubescent below; petals glabrous; corona-lobes shorter than the tube — 4
4 Inflorescence pedunculate; corona-lobes broad or reduced to teeth — 5
  Inflorescence sessile, fasciculate; corona-lobes filamentous — 4. *C. hastifolium*
5 Leaves suborbicular, as long as broad; inflorescence racemose — 5. *C. validum*
  Leaves ovate to elliptic, longer than broad; inflorescence a pedunculate umbel — 6. *C.* sp. *A*

1. Cynanchum tetrapterum (*Turcz.*) *R. A. Dyer*

A climbing, glabrous, leafless shrub with fleshy stems and sessile clusters of shortly pedicellate flowers; petals green or brown, often reflexed; corona white, with 5–15 short blunt teeth.

Common in dry *Acacia* bushland, especially where disturbed. KIS, NAR, BAR, RV, MAG, EMB.

Agnew 8750; Glover 3207.

2. Cynanchum altiscandens *K. Schum.*

A climbing sparsely-pubescent shrub with ovate leaves, acute at apex, rounded at base; flowers in shortly pedunculate umbels; petals green; corona white, tubular, toothed; fruit 3-ridged.

Probably the commonest Asclepiad in upland forest edges. HE, HC, HM, HA, NAR, RV, NBI.

Agnew, Kibe and Mathenge 10481; Archer 285.

3. Cynanchum abyssinicum *Decne.* (see p. 386)

A climbing hairy shrub with lanceolate, hastate or cordate leaves which are densely white-tomentose below; flowers in short-pedunculate, very short racemes; petals green and purplish; corona white, with 15 long subulate lobes, 5 within the tube; fruit tuberculate.

Uncommon plant found at the edges of upland rain forest. HE, HT, HM, HA.

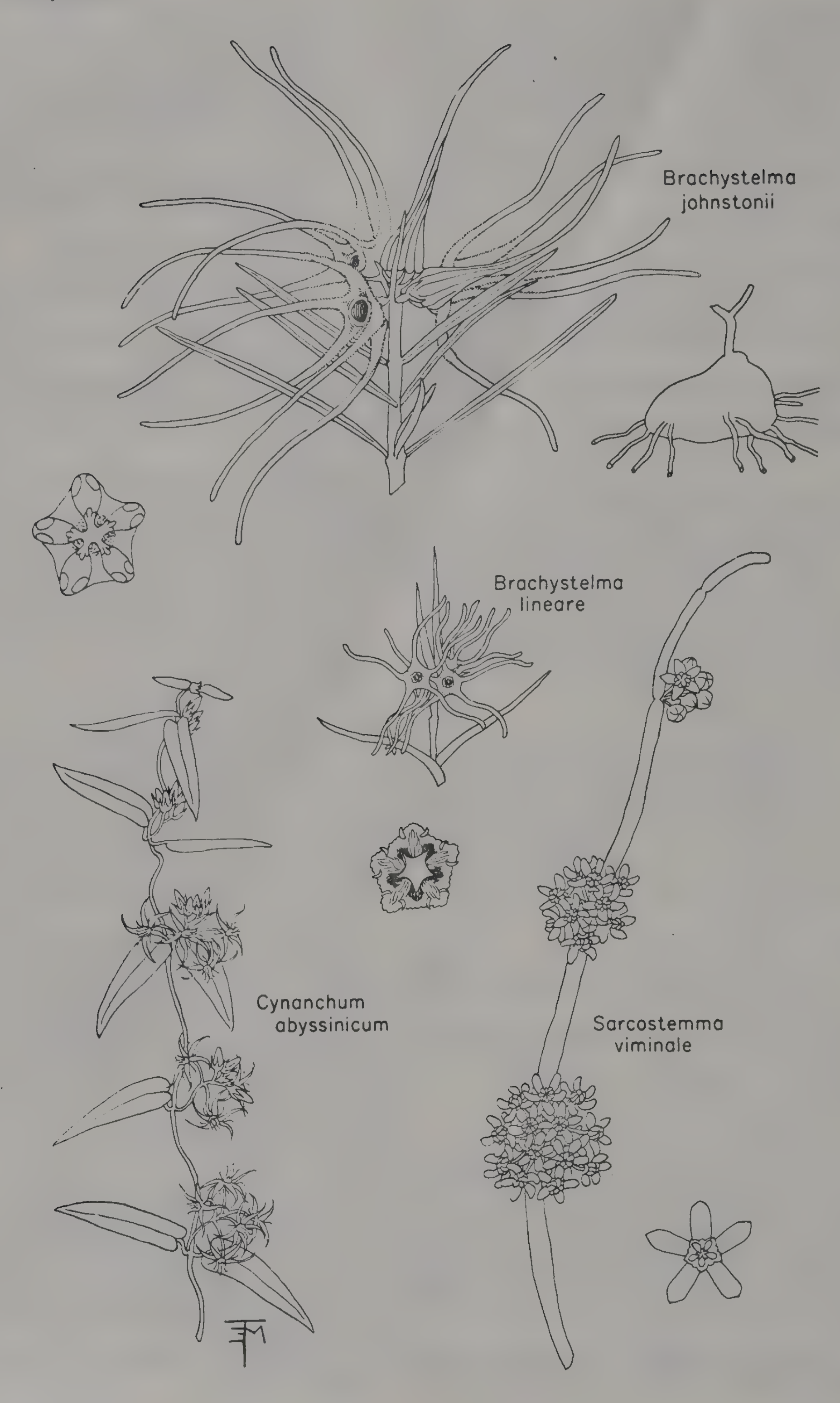
Irwin 182; Mathenge 376.

4. Cynanchum hastifolium *N. E. Br.*

A climbing, sparsely-tomentose shrub with ovate to lanceolate, hastate leaves frequently fasciculate; flowers fasciculate in sessile umbels; petals green; corona white with 5 subulate lobes and 5 deltoid teeth all terminal.

Rare plant found in dry country. KAJ.

Rauh Ke 238.


Brachystelma johnstonii
Brachystelma lineare
Cynanchum abyssinicum
Sarcostemma viminale

5. Cynanchum validum *N. E. Br.*

A semi-succulent, sparsely pubescent, trailing shrub or climber with suborbicular cordate leaves; inflorescences racemose, pedunculate; petals yellow-green with brown spots; corona yellow with 10 short terminal teeth; fruit 3-winged.

Rare plant found in dry rocky country. KAJ, NAR, RV.

Glover 3339.

6. Cynanchum *sp.* A.

A woody, sparsely pubescent climber with ovate-elliptic, bullate, cordate or rounded leaves; flowers in pedunculate umbels; petals green with dull purplish markings; corona green or purple; fruit unknown.

Uncommon plant found in montane rain-forest, especially bamboo. HE, HA.

Agnew 7179, Glover 1492.

25. SARCOSTEMMA *R. Br.*

Twining or decumbent shrubs with green, fleshy stems and reduced, scale-like leaves; flowers in sessile umbels; petals hardly fused at base, with erect lobes; corona-lobes in two series, both fused to staminal column, the outer forming a continuous rim below the stamens, the inner, of lobes one below each stamen; stamens fused with pendulous pollinia; fruit smooth.

Sarcostemma viminale (*L.*) *R. Br.* (see p. 386)

A trailing or twining shrub with pubescent or glabrous green stems; flowers white; petals 5–7 mm long.

A variable plant which has three forms: a prostrate one, rooting at tips of branches, with short internodes and knobbly nodes, a climber with thick (over 8 mm) pubescent internodes, and a climber with thin glabrous internodes. All these forms have similar flowers and fruits, yet they may eventually prove to be distinct.

The plant is found in dry country, often where rocky or disturbed. HE, HT, HA, KIT, MUM, KIS, NAR, BAR, RV, MAG, NAN, MAC, NBI, KAJ.

Bally (11339) 119; Strid 3328.

26. PERGULARIA *L.*

Climbers with cordate leaves and hairy stems; flowers in racemes; corolla with a basal cylindrical tube and erect hairy lobes; corona double, of 5 outer lobes joined in a ring around the base of the staminal column and 5 inner ones fused to the staminal column, each with an erect, bifid apical process and a basal spur; stamens fused; pollinia erect; follicle usually ornamented.

Pergularia daemia (*Forsk.*) *Chiov.* (see p. 371)

A climbing or trailing herb or soft shrub with tomentum of mixed stout and subulate hairs on nearly all parts; racemes very long-pedunculate, often exceeding the leaves; petals green, sometimes with purple tinges; corona pure white; follicles conical, often covered with soft fleshy processes.

Probably our commonest climbing Asclepiad, this species is found in disturbed places in dry country to 6000 ft. The fruits are very variable, some being very woolly and others, principally from drier places, almost glabrous. HE, HC, HA, KIT, MUM, KIS, NAR, BAR, RV, MAG, MAC, NBI, KAJ.

Strid 2738; Napper 846.

27. TYLOPHOROPSIS *N. E. Br.*

Similar to 31. *Tylophora* in all respects except for the pollinia which are pendulous in each anther cell.

Tylophoropsis heterophylla *N. E. Br.*

A tomentose climber with ovate leaves, rounded or very shortly cordate at base; flowers in sparsely branched inflorescences, each fascicle of flowers sometimes appearing umbellate; petals pubescent above, maroon.

Rare plant found in upper forest levels to 11 000 ft altitude at the edges of clearings. HM, HA.

Polhill 248; Agnew 7140.

28. DIPLOSTIGMA *K. Schum.*

Climbers or erect suffrutescent herbs with fascicles of small flowers at nodes; corolla spreading, deeply lobed; corona double, the outer being a ring around the base of the staminal column, the inner consisting of 5 fleshy lobes attached to the stamens above, widening below; follicle smooth; seed with rugosities on one face.

Diplostigma canescens *K. Schum.*

An erect suffrutescent herb with sparsely-branched stems or a weak, woody climber, pubescent, with ovate to linear leaves; flowers minute (to 2·5 mm long), greenish.

Uncommon plant found in dry burnt grassland. MAG.

Greenway 11761.

29. GYMNEMA *R. Br.*

Woody, pubescent climbers; flowers in axillary umbels; corolla with a tube and 5 lobes, bearing the conspicuous corona as fleshy lobes between the petals; stamens fused throughout; pollinia present, minute, erect, solitary in each anther cell.

Gymnema sylvestre *R. Br.*

Softly pubescent climber with ovate leaves; flowers yellow in short-pedunculate umbels; fruit smooth.

Uncommon plant found in evergreen bushland. MUM, KIS.

Agnew, Musumba, and Kiniaruh 7987; Kokwaro 99.

30. GONGRONEMA (*Endl.*) *Decne.*

Similar in all respects to 33. Dregea except for the constantly cordate leaves, smaller (up to 5 mm long) triangular corolla lobes, and constantly included stigma.

Gongronema angolense (*N. E. Br.*) *Bullock*

A woody tomentose climber with ovate, cordate leaves and pedunculate umbels of green flowers; flowers small, to 6 mm long; stigma not exceeding the stamens.

Rare plant found in western Kenya. KIS.

Bally 7472.

31. TYLOPHORA *R. Br.*

Climbing shrubs; flowers in panicles or umbels; corolla with a short tube and long glabrous or pubescent lobes; corona obscure, adherent to staminal column, free or not at apex; pollinia minute, pollen masses horizontal, often free from the pollen carrier.

1 Leaves deeply cordate, the depth of the sinus equal to more than half the petiole length — 1. *Tylophora sylvatica*
 Leaves rounded or cuneate at base, if shallowly cordate then the depth of the sinus much less than half the petiole length — 2
2 Petals sparsely tomentose on margins only — 2. *Tylophora lugardae*
 Petals densely pubescent on inner surface — 3
3 Corona conspicuous, joining the corolla to the staminal column and forming pockets between the corolla lobes — 3. *Tylophora* sp. *B*
 Corona inconspicuous, of minute fleshy erect organs adpressed to staminal column — *Tylophoropsis heterophylla*

1. Tylophora sylvatica *Decne.*

Puberulent climber with ovate cordate leaves and fascicles of maroon flowers in branching panicles; petals glabrous.

Rare plant found in bushland in western Kenya. MUM, NAR.

Archer 269; Agnew and Musumba 8578.

2. Tylophora lugardae *Bullock*

Sparsely pubescent climber with ovate-lanceolate leaves usually rounded at base; flowers in pedunculate rather irregular umbels; petals green with a maroon centre, wrinkled in bud and tomentose on the margin.

Rare plant found in upland dry forest edges and disturbed places. HC, HA, NAR, NBI, KAJ.

Archer 303; Lugard 656 (Type).

3. Tylophora *sp.* **B.**

Similar in vegetative parts to 27. *Tylophoropsis heterophylla* and in inflorescence to *Tylophora lugardae* this species has densely pubescent petals and the curious corona characters mentioned in the key.

Only one collection known to this author, from south-west Mau forest, at 7100 ft. HM.

Kerfoot 2886.

32. SPHAEROCODON *Benth.*

Erect herbs or shrubs with flowers in pedunculate lateral cymes; corolla saucer-shaped, with erect lobes; corona of 5 small fleshy tubercles or teeth on the staminal column; stamens fused; pollinia erect.

Sphaerocodon obtusifolium *Benth.*

Usually a many-stemmed herb, or suffrutescent at base, with oblong-elliptic leaves and lateral cymes of maroon flowers.

Rare plant found in western Kenya in burnt grassland and only once recorded, from 7700 ft on Mt. Elgon. HE.

Lugard 618.

33. DREGEA *E. Mey.*

Climbing shrubs, often tomentose, with umbellate or cymose inflorescences; corolla with a short tube and spreading lanceolate lobes over 5 mm long; corona attached to the staminal column, of separate, entire lobes; stamens fused, bearing erect pollinia; style equalling or exceeding the stamens.

1 Stigmas projecting through the staminal disc as a filamentous two-lobed extension — 2
 Stigmas not overtopping the staminal disc — 3
2 Inflorescences glomerulate, sessile; fruits 4-winged — 1. *D. stelostigma*
 Inflorescences pedunculate, loosely cymose; fruits unwinged — 2. *D. schimperi*
3 Inflorescence sub-umbelliform, forming a single spherical mass of flowers; corona massive, fleshy, terete — 3. *D. abyssinica*
 Inflorescence a branching ± corymbose cyme or umbellate with 2–5 umbels on each peduncle; corona lobes dorsally flattened — 4

4 Inflorescence a branching corymbose cyme; corolla lobes longer than tube, hairy within; fruit 4-winged 4. *D. rubicunda*
Inflorescence of umbels; corolla lobes ± equal to the tube, glabrous within; fruit unknown *Gongronema angolense*

1. Dregea stelostigma (*K. Schum.*) *Bullock*

A pubescent to tomentose climbing herb with suborbicular to broad-ovate leaves, and sessile umbels or fascicles of short-pedicellate flowers; flowers to 4 mm long, yellow-green; fruits 4-winged.

Rare plant found in dry country, and doubtfully recorded for our area. NAN.

Adamson 1.

2. Dregea schimperi (*Decne.*) *Bullock* (see p. 384)

A robust tomentose climber with broad-ovate to orbicular leaves and loose, pedunculate, cymose inflorescences; flowers to 11 mm long, yellow; fruit with numerous wrinkles but not winged.

Common in upland forest edges. HE, HA, HK, HT, NAR, MAC.

Strid 3627; Verdcourt 668.

3. Dregea abyssinica (*Hochst.*) *K. Schum.*

Sparsely pubescent climber similar to *D. schimperi* except for the inflorescences which are umbellate, the fleshy terete corona lobes, and the short stigma; fruit with many undulate ridges.

In rocky places in dry woodland and in riverine forest. NAR, EMB, NBI, KAJ.

Verdcourt 438.

4. Dregea rubicunda *K. Schum.*

A sparsely pubescent climber with suborbicular to ovate-elliptic leaves; flowers in loose, corymbose, pedunculate cymes; corolla pubescent above; corona of flat, lanceolate lobes; fruit strongly 4-winged.

Rare plant found in dry *Acacia-Commiphora* bushland. BAR, MAG.

Bally 2669.

34. LEPTADENIA *R. Br.*

Climbers or shrubs often with reduced leaves and photosynthetic stems; flowers many, in umbel-like lateral cymes; corolla hairy, with spreading or erect lobes and a short, obscure tube; corona of 5 fleshy lobes, hairy at apex, inserted between the corolla lobes; stamens fused, pollinia erect, with a transparent appendage on the pollen-mass.

Leptadenia hastata (*Pers.*) *Decne.* (see p. 384)

A leafy climber, pubescent on all parts, with lanceolate to ovate leaves and dense masses of cream flowers on short lateral peduncles.

Only in dry country in the north of our area. BAR, recorded by Mrs. E. M. Tweedie.

Newbould 6774 (no specimens seen from our area).

35. TENARIS *E. Mey.*

Erect herbs, often leafless in flower, from a tuberous rootstock, with linear leaves, very similar to *Brachystelma* except for the simply 5-lobed outer corona.

Tenaris rostrata *N. E. Br.*

An erect, loosely branched herb with linear leaves and paired flowers on long-pedunculate terminal inflorescences; flowers maroon.

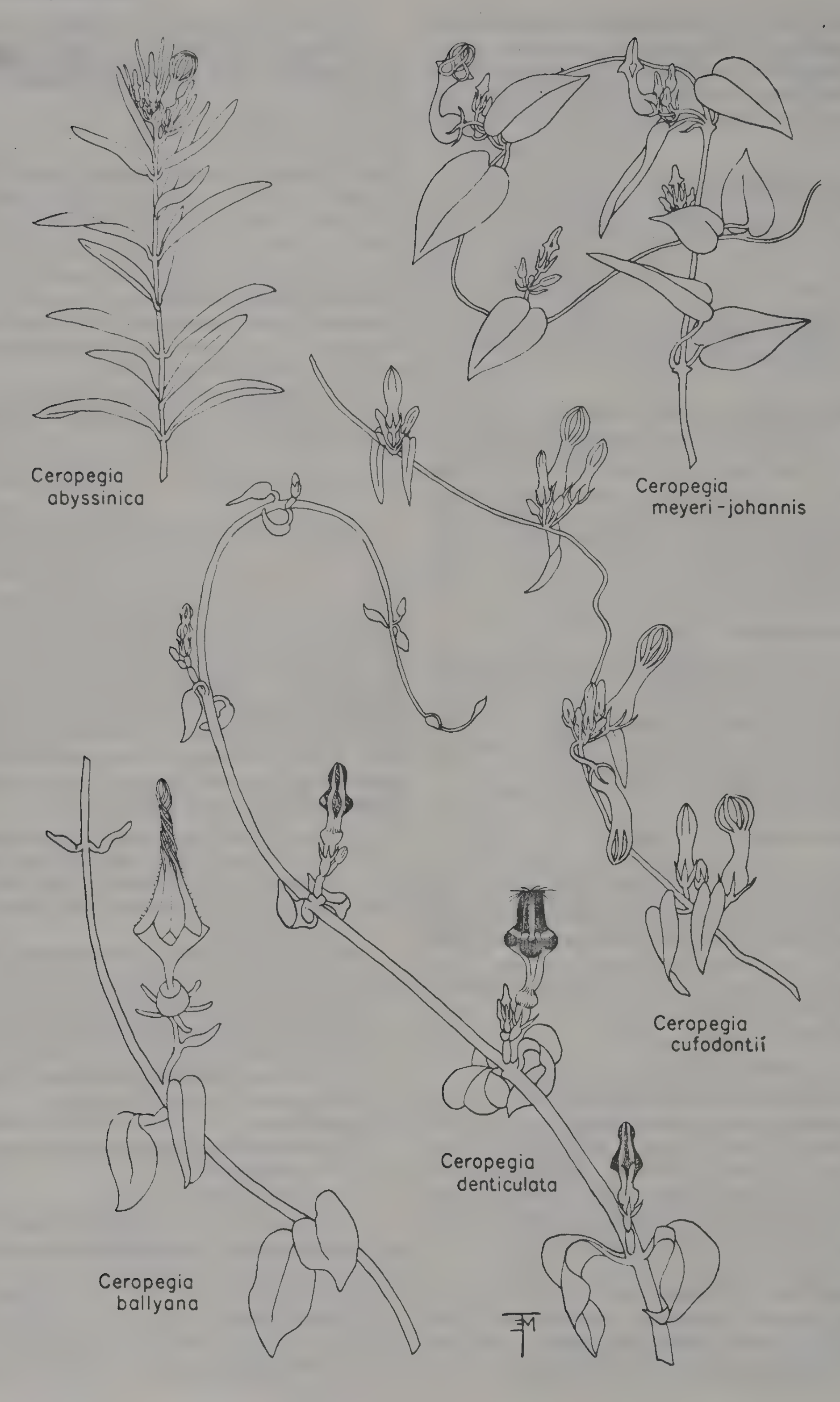
Rare plant found in dry grassland, recorded from Chyulu hills and Narok District. NAR, KAJ.

Bally 510.

36. CEROPEGIA *L.*

Erect or, more usually, climbing herbs, frequently succulent, with flowers in axillary cymes or umbels or, more usually, solitary; leaves entire; calyx with 5 free lobes; corolla tubular, usually inflated at base and with the 5 lobes separating laterally but coherent at tip; corona double, attached to the staminal column, the outer entire or 5–10-toothed ± fused to the 5 inner lobes, or reduced to pouches alternating with the stamens; staminal column almost at the base of the corolla, very short; anthers erect or ascending, without appendages and with solitary, erect pollen masses in each cell; follicles smooth.

1 Corolla lobes with apical club-shaped hairs which are so delicately attached that they wave and vibrate in the gentlest wind 2
Corolla lobes glabrous or with stiffly attached linear hairs 4
2 Stem smooth or obscurely angled; peduncles as long as some pedicels or little shorter 3
Stem rough with small ridges; peduncles much shorter than pedicels or absent 1. *C.* sp. *A*
3 Leaves succulent, often dentate or sinuate at margins, less than 3 cm long 2. *C. denticulata*
Leaves not succulent, entire, usually over 3 mm long 3. *C. batesii*
4 Stems pubescent all over 5
Stems glabrous, or rarely two lines of minute pubescence extending upwards from nodes 9
5 Plant erect 4. *C. abyssinica*
Plant climbing 6
6 Cymes pedunculate 7
Cymes sessile 8


Ceropegia
abyssinica
Ceropegia
meyeri-johannis
Ceropegia
cufodontii
Ceropegia
denticulata
Ceropegia
ballyana

7 Leaves rounded and conspicuously apiculate at apex 5. *C. euryacme*
Leaves acute, hardly apiculate at apex 6. *C. meyeri-johannis*
8 Corolla lobes equal to or longer than corolla tube; corolla less than 13 mm long 7. *C. stenoloba*
Corolla lobes much shorter than corolla tube; corolla over 17 mm long 8. *C. cufodontii*
9 Leaves linear, over 6 times as long as wide **10**
Leaves ovate to elliptic, less than 4 times as long as wide **13**
10 Inflorescence elongate, with many flower-bearing nodes; corolla under 11 mm long 9. *C. crassifolia*
Inflorescence of a sessile or pedunculate umbel-like fascicle of flowers **11**
11 Plant from swollen, spindle-shaped roots; corolla lobes over 1 cm long 10. *C. stenantha*
Plant from a globose tuber, with narrow roots; corolla less than 1 cm long **12**
12 Peduncle over 3·5 mm long 11. *C. brosima*
Peduncle less than 2 mm long 12. *C.* sp. *B*
13 Corolla lobes over 2 cm long, as long as the corolla tube **14**
Corolla lobes less than 1·5 cm long, shorter than the corolla tube **15**
14 Leaves ovate, cordate at base 13. *C.* sp. *C*
Leaves oblong–elliptic, rounded at base 17. *C. ballyana*
15 Plant growing from a globose tuber 5. *C. euryacme*
Plant with swollen or fibrous roots and without a tuber at base **16**
16 Plant with fibrous roots **17**
Plant with swollen sausage-shaped roots 14. *C.* sp. *D*
17 Leaves ovate, widest at the base, seldom over 3 cm long 15. *C. seticorona*
Leaves elliptic, widest at the middle, frequently over 5 cm long **18**
18 Calyx lobes over 2 mm long; corolla lobes rounded at apex 16. *C. succulenta*
Calyx lobes less than 2 mm long; corolla lobes acute at apex 17. *C. ballyana*

1. Ceropegia *sp.* **A.**

Roots conspicuously fusiform; stems succulent, rough, with many small longitudinal ridges, grey-green; leaves ovate-lanceolate to 8 mm long almost stem-clasping; flowers sessile; corolla silvery grey, lobes edged velvety black banded black, white, green with vibratile clavate hairs at tips.

Rocky bushland and grassland. NAR, RV, MAG.

Archer 429.

2. Ceropegia denticulata *K. Schum.* (see p. 390)

Roots hardly swollen; stem succulent sometimes somewhat angular; green with occasional longitudinal white spots; leaves succulent, ovate, to 3 cm long, sometimes serrate; corolla yellow-green with varying amounts of brown-maroon streaks and spots especially towards top of tube, lobes banded green, white, blackish, with vibratile clavate hairs at tips.

Bushland. HA, KIS, NAR, RV, EMB, MAC, NBI, KAJ.

Gillett 17305.

3. Ceropegia batesii *S. Moore*

Roots fibrous; vegetative parts glabrous; stem fleshy shiny; leaves large elliptic acuminate somewhat coriaceous; peduncle 1–2 cm; corolla whitish green, towards lobes brownish maroon, lobes brown/maroon and yellow with a few vibratile hairs at tips.

Forest. KIS; Archer 433.

4. Ceropegia abyssinica (*A. Rich.*) *Decne.* (see p. 390)

Globose tuber; vegetative parts hairy; stems straight not twining; leaves ovate to lanceolate sometimes serrate; flowers sessile, many; corolla straight, cream with blackish lobes.

Grassland. HT, KIT, RV, NBI, KAJ.

Harvey 56; Tweedie 97.

5. Ceropegia euryacme *Huber*

Globose tuber; vegetative parts glabrous or sometimes hairy; stem wiry; leaves fleshy, lanceolate-ovate; peduncle 10 mm; corolla whitish, lobes maroon with greenish tips, with ciliate hairs on edges.

Under bushes in rocky outcrops. KIS, RV, MAG, EMB, MAC, NBI.

Archer in Bally 8066; Archer 436.

6. Ceropegia meyeri-johannis *Engl.* (see p. 390)

Roots swollen spindle-shaped; vegetative parts hairy; stem wiry; peduncle 30 mm; corolla greenish-white with dull maroon spots and streaks, lobes green or maroon with ciliate hairs on edges.

Forest. HT, HA, MUM, KIS, NAR, RV, NAN, MAC, NBI, KAJ.

Napier 3111; Verdcourt 3968(s).

7. Ceropegia stenoloba *Chiov.*

Globose tuber; vegetative parts hairy; stem wiry; leaves ovate to lanceolate, sometimes doubly dentate; flowers sessile, corolla 'S' shaped, whitish, lobes terete, maroon.

Rocky grassland. MAC, NBI, KAJ.

Archer 422.

8. Ceropegia cufodontii *Chiov.* (see p. 390)

Roots swollen spindle-shaped; vegetative parts hairy; stems wiry; leaves ovate to broadly lanceolate; flowers sessile, corolla whitish, green/yellow more or less streaked maroon, ciliate hairs on inside of lobes.

Rocky grassland and bushland. HE, HC, HT, MUM, RV.

Agnew 10326.

9. Ceropegia crassifolia *Schltr.*

Roots swollen spindle-shaped; vegetative parts glabrous; stem fleshy, short; leaves fleshy linear-lanceolate; peduncle 5 mm; corolla pale cream/green/pink, with ciliate hairs inside lobes.

Grassland. HA, NBI, KAJ.

Armstrong 544.

10. Ceropegia stenantha *K. Schum.*

Roots swollen spindle-shaped; vegetative parts glabrous; stem fleshy, somewhat angular; leaves fleshy linear-lanceolate; flowers sessile, corolla straight, creamy-pink.

Rocky grassed bushland. MAC, KAJ.

Archer 500; Agnew 8825.

11. Ceropegia brosima *Bruce & Bally*

Globose tuber; stem wiry; leaves linear.

Rare plant found in grassland. MUM.

Opiko 697.

12. Ceropegia *sp.* **B.**

Globose tuber; vegetative parts glabrous; stem wiry; leaves linear-lanceolate; peduncle 6 mm; corolla greenish white, lobes dark maroon inside, ciliate hairs on edges.

Grassland. NBI.

Archer 427.

13. Ceropegia *sp.* **C.**

Roots fibrous; stem succulent, blue-grey; leaves ovate, cordate, fleshy; corolla tube yellow with maroon spots, lobes yellow in lower half, upper half maroon, with ciliate hairs on edge.

Thorn-tree bushland. EMB, MAC, KAJ.

Archer 63.

14. Ceropegia *sp.* **D.**

Roots swollen sausage-shaped; vegetative parts glabrous; stem wiry; leaves ovate, elliptic, fleshy; peduncle 30 mm, extending; corolla yellowish, tips of lobes maroon with a few ciliate hairs.

Edge of forest. HA, BAR, RV, NAN, MAC, NBI, KAJ.

van Someren 218; Archer 75.

15. Ceropegia seticorona *E. A. Bruce*

Fibrous roots; stem succulent, blue-grey; leaves ovate, fleshy; calyx lobes 1–2 mm long; corolla yellow with varying amounts of maroon spots and streaks or nearly all maroon, occasional ciliate hairs on lobes.

Thorny bushland. KIS, BAR, MAG, NAN, EMB, MAC, NBI, KAJ.

Milne-Redhead and Taylor 7151.

16. Ceropegia succulenta *E. A. Bruce*

Roots fibrous; stem thick, succulent, leaf nodes prominent or depressed; leaves large oval-elliptic, succulent, dark green with white veins; peduncle 5–10 cm; corolla yellow-green with maroon spots, lobes whitish with green tips, short ciliate hairs on edges.

Dry forest. HA, NAR, RV, NBI.

Agnew 9577.

17. Ceropegia ballyana *Bullock* (see p. 390)

A glabrous succulent climber with broad oblong or elliptic leaves and large solitary flowers; corolla greenish to yellow, with purple spots and long lobes ending acutely.

Dry bushland. BAR, EMB.

Bally 12321; Tweedie 2450.

37. BRACHYSTELMA *R. Br.*

Herb with tubers or fleshy roots, rarely climbers; flowers in lateral or terminal few-flowered umbels; petals spreading, shortly joined at base, usually with linear lobes; corona double, sometimes obscurely so, on staminal column, with an outer corona of bifid lobes or paired teeth, sometimes fused to the inner 5 lobes; pollinia horizontal or ascending with a pellucid margin near the apex; follicles smooth.

1	Petal lobes over 1·5 cm long	2
	Petal lobes under 1 cm long	3
2	Flowers in terminal pedunculate umbels, much overtopping the leaves; petal lobes 2·5–11 cm long	1. *B. Johnstonii*
	Flowers in axillary or terminal sessile umbels, overtopped by linear leaves; petal lobes less than 2·5 cm long	2. *B. lineare*
3	Pedicels longer than flowers	3. *B. keniense*
	Pedicels shorter than flowers	4. *B.* sp. *A*

1. Brachystelma johnstonii *N. E. Br.* (see p. 386)

Erect small herb from a fleshy tuber, with linear leaves and terminal umbels of short-pedicellate flowers; petals maroon or brown, with masses of white hairs at base.

Rare plant found in short grassland and shallow soils in western Kenya. HE, KIT.

Tweedie, May 1967 (spirit); Irwin 157.

2. Brachystelma lineare *A. Rich.* (see p. 386)

Similar to *B. johnstoni* but with ± subulate leaves overtopping the smaller, greenish-yellow flowers.

Rare plant found in shallow soil grassland near Nairobi. HA, NBI.

Heine in EAH 13765.

3. Brachystelma keniense *Schweinf.*

A dwarf puberulent herb from a globose tuber, with linear-elliptic leaves and 1–3 long-pedicellate flowers at the upper nodes; petals triangular.

Rare plant found in dry grassland. NAN, ?EMB.

Hansen 79.

4. Brachystelma *sp.* **A.**

Similar to *B. keniense* but the flowers almost sessile and the leaves long-linear, pubescent.

Known by 2 collections from grassland near Nairobi, (Langata and Lukenia). MAC, NBI.

Archer 287.

38. ECHIDNOPSIS *Hook. f.*

Trailing fleshy-stemmed leafless herbs with leaf-bases enlarged, truncate, covering the stem; flowers lateral, in fascicles or solitary; corolla with 5 spreading lobes and a short, bell-shaped tube; corona arising from the staminal column, often in two series, the outer of 5 short lobes or pouches alternating with the anthers or none, the inner of 5 fleshy lobes bent inwards over the anthers; stamens fused; pollinia horizontal.

Echidnopsis dammiana *Spreng.*

A trailing fleshy herb with 8–10 rows of square outlines on the stem and small, solitary, subsessile dark purple flowers.

Rare plant found around termite mounds in dry bushed grassland. The plant should turn up in the BAR area, and a sight record has been reported from the dry country next the lake in MUM. MAG.

Glover and Samuel 3241.

39. EDITHCOLEA *N. E. Br.*

Succulent with trailing stems and lateral solitary flowers; corolla very large, with a short tube and spreading, flat lobes; corona as in *Echidnopsis*; stamens fused; pollinia erect, large.

Edithcolea grandis *N. E. Br.* (see p. 394)

A trailing succulent with yellow, horny conical knobs on the stems and large (often 12 cm diameter), very conspicuous purple and yellow flowers edged with vibratile, club-shaped hairs.

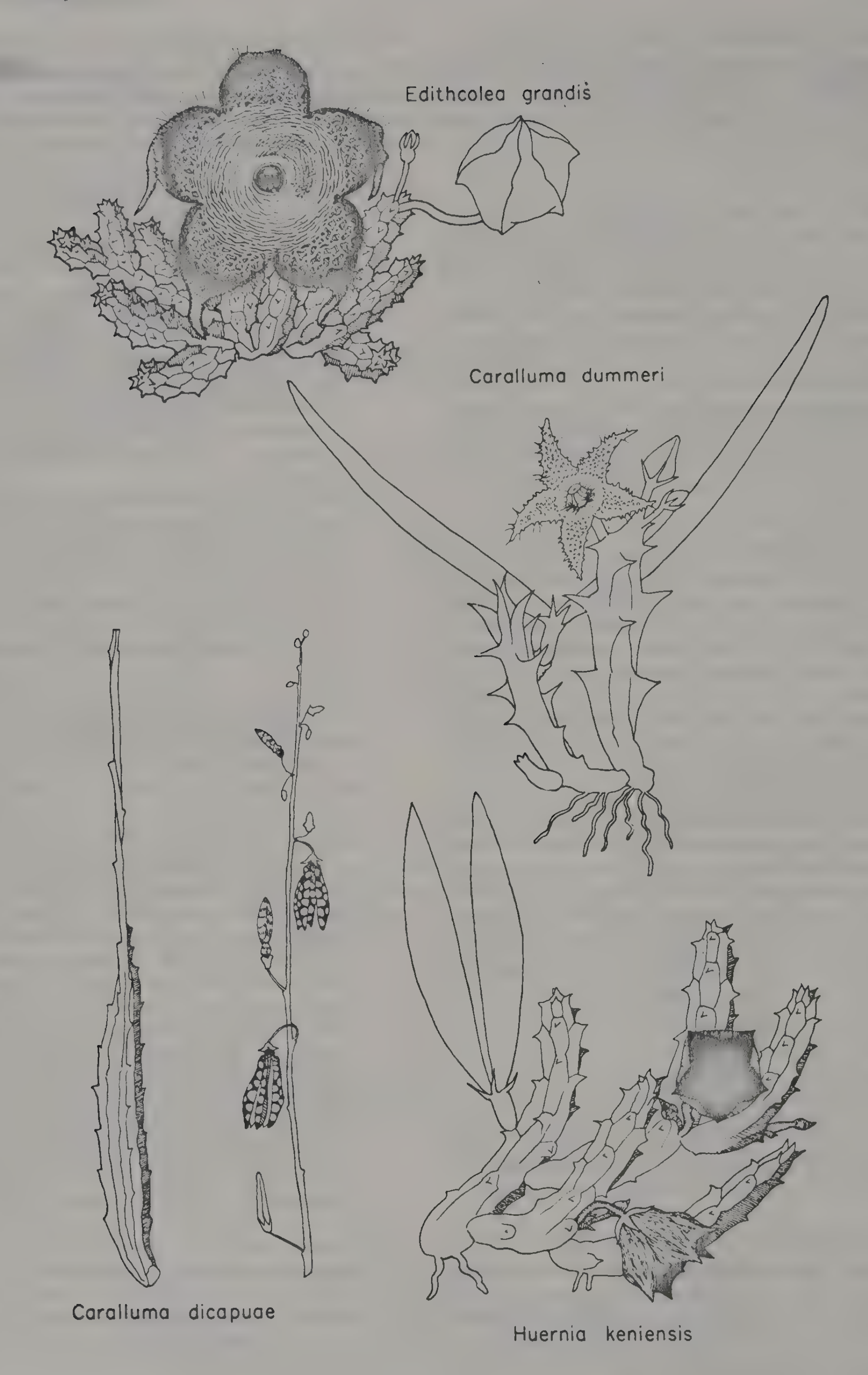
Rare plant found in dry rocky country. MAC, KAJ.

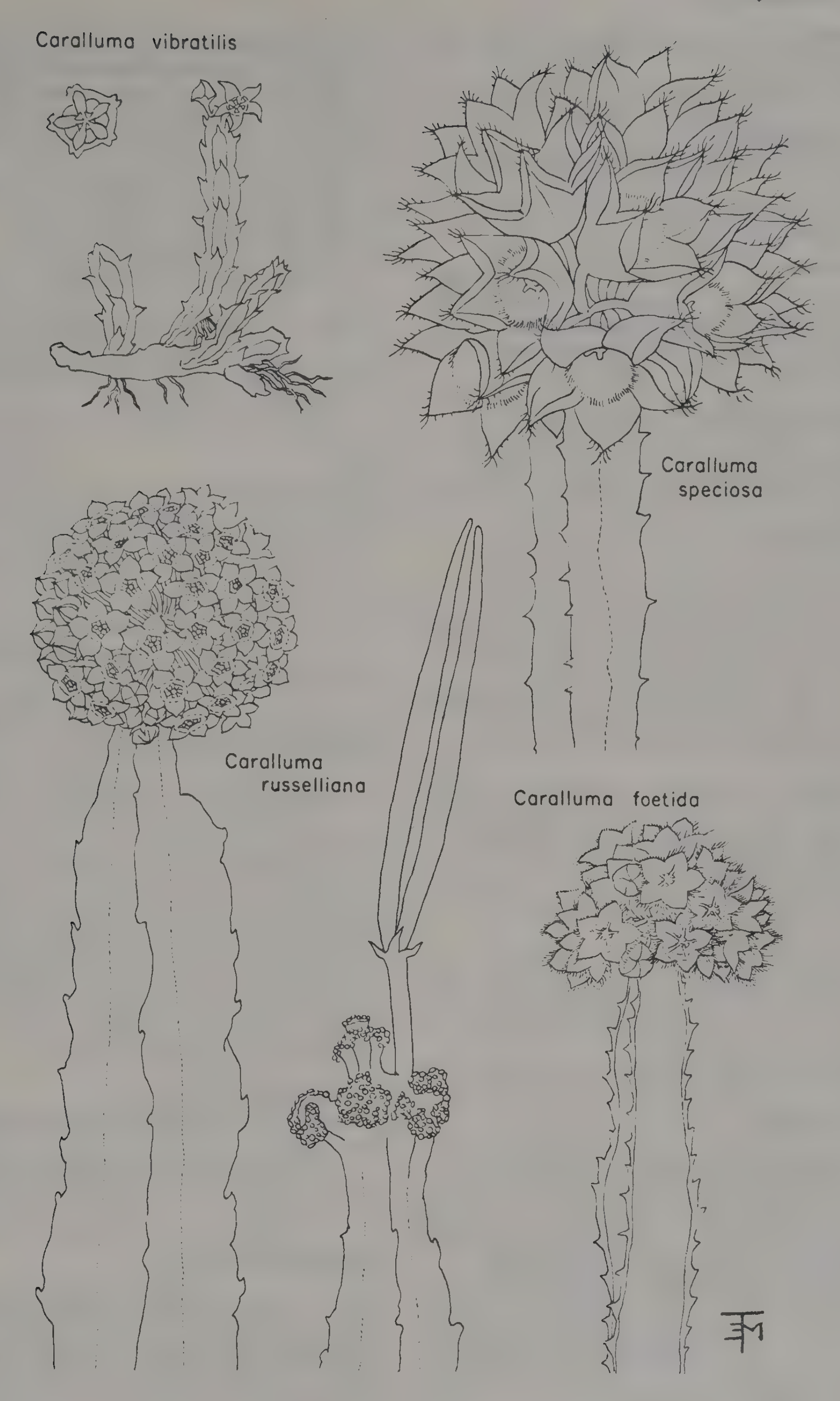
Jackson 3087.

40. CARALLUMA *R. Br.*

Erect or creeping, fleshy leafless herbs with 4–6 (rarely 3) angles on the stem; flowers in lateral or terminal racemes or heads, or solitary; corolla 5-lobed, sometimes campanulate at base; corona in two series, arising from the staminal column, the outer usually 10-toothed, fused to the inner series of 5 erect or decumbent entire or denticulate lobes; stamens fused; pollinia horizontal or ascending, with a pellucid margin; follicles smooth.

1 Inflorescence a terminal, elongated raceme with a narrow, stiff (not fleshy) rachis — 8
  Inflorescence a terminal globose head, or flowers solitary or in pairs on upper part of undifferentiated fleshy stem — 2
2 Inflorescence a globose head — 3
  Inflorescence of solitary or paired flowers in upper axils — 5
3 Corolla lobes with club-shaped, loose (vibratile) hairs along the edges, glabrous or tuberculate within; corona glabrous — 4
  Corolla lobes without hairs along the margins but minutely pubescent within; corona hairy on the back — 1. *C. russelliana*
4 Corolla lobes glabrous and ± smooth within — 2. *C. speciosa*
  Corolla lobes covered with low, minutely pubescent tubercles within — 3. *C. foetida*
5 Stems with acute angles or with soft prickles representing leaves — 6
  Stems terete, smooth or with rounded obscure ridges — 4. *C. socotrana*
6 Corolla with club-shaped, delicate, loosely attached (vibratile) hairs on the basal edges of the pubescent lobes; corona lobes apparently in one whorl — 5. *C. vibratilis*
  Corolla lobes glabrous or hairy but never with vibratile hairs at the basal edges of the lobes; corona in two whorls — 7
7 Plant rhizomatous; corolla up to 10 mm long, velvety-pubescent above, the hairs without swolled persistent bases; outer coronal lobes erect, denticulate — 6. *C. subterranea*
  Plant creeping on the surface of the ground; corolla over 15 mm long, glabrous or hairy above; hairs, if any, long, deciduous, attached to swollen persistent bases; outer corona lobes with spreading points — 7. *C. dummeri*
8 Corolla lobes rigidly spreading — 9
  Corolla lobes loosely pendulous — 8. *C. dicapuae*
9 Corona and gynostemium held on a stalk above the base of the flower — 9. *C. gracilipes*
  Corona and gynostemium sessile — 10. *C. priogonium*


Edithcolea grandis
Caralluma dummeri
Caralluma dicapuae
Huernia keniensis


Caralluma vibratilis
Caralluma speciosa
Caralluma russelliana
Caralluma foetida

1. Caralluma russelliana (*Brogn.*) *Cufod.* (see p. 395)
A massive erect succulent with 4-angled stem up to 5 cm thick and with a large head of smallish black-purple or dark violet flowers.
Uncommon plant found in dry country. BAR, NAN.
Brown, October 1962.

2. Caralluma speciosa *N. E. Br.* (see p. 395)
Similar in habit to *C. russelliana* but with shorter stems and fewer and much bigger flowers.
Rare plant found in dry alkaline country. MAG.
Greenway and White in EAH 12870.

3. Caralluma foetida *E. A. Bruce* (see p. 395)
Similar in habit to *C. speciosa* but with narrower (to 4 cm thick) stems and with hairy flowers.
Uncommon plant found in dry alluvial country. BAR.
Leippert 5278.

4. Caralluma socotrana (*Balf. f.*) *N. E. Br.*
An erect, caespitose, fleshy perennial with cylindrical or obscurely angled stems and terminal groups of 2–3 black-purple flowers.
Rare plant found in alkaline alluvium and stony ground, only recorded from Magadi. MAG.
Greenway 8991.

5. Caralluma vibratilis *Bruce & Bally* (see p. 395)
Perennial with subterranean or superficial then ascending stems bearing linear leaf-scales, and terminal groups of dark flowers.
Rare plant found in rocky grassland. NAN.
Bally 2539.

6. Caralluma subterranea *Bruce & Bally*
Similar to *C. vibratilis* but with greenish flowers more scattered along the stem and underground stems.
Rare plant found in dry stony grassland. MUM, RV.
Opiko in EAH 12492.

7. Caralluma dummeri (*N. E. Br.*) *Bruce* (see p. 395)
A decumbent fleshy perennial with ascending, often variegated stems bearing lines of conical projections; flowers ± terminal, pedicellate, glabrous or hairy within, greenish or cream.
Probably the commonest succulent Asclepiad, this is to be found in the *Combretum* woodland and adjacent grassland in rocky places with a sandy soil. HA, KIT, MUM, NAR, RV, MAG, NAN, MAC, NBI, KAJ.
Agnew 7304; Bogdan 77/60.

8. Caralluma dicapuae (*Chiov.*) *Chiov.* (see p. 394)
A caespitose perennial herb with 4 lines of conical projections on the square stems, and with long terminal racemes of grey-green flowers with maroon spots and stripes on the pendulous petals; petals broadest furthest from the flower.
Uncommon plant found in dry rocky bushland. MUM, KIS, BAR, MAG, KAJ.
Verdcourt 30313; Tweedie 66/383.

9. Caralluma gracilipes *K. Schum.*
Similar to *C. dicapuae* but with narrow spotted petals which spread and are widest at the base.
Rare plant found in dry rocky bushland in our area, although it is apparently common in the drier parts of Kenya. MAC.
Record from Bally (1969) in Candollea 24/1:17.

10. Caralluma priogonium *K. Schum*
Similar to *C. gracilipes* except for the keyed characters, also rare in dry areas. BAR.
Record from Bally (1969) in Candollea 24/1:9.

41. HUERNIA *R. Br.*

Trailing, fleshy-stemmed herbs with lateral fascicles or umbels of pedicellate flowers; corolla bell-shaped, the lobes usually shorter than the tube, with accessory teeth between the lobes; corona and stamens as in *Echidnopsis* but with the inner corona often produced into erect horns.

1	Corolla over 15 mm long	1. *H. keniensis*
	Corolla up to 15 mm long	2. *H. aspera*

1. Huernia keniensis *R. E. Fries* (see p. 394)
A trailing fleshy herb with 4–6 rows of conical fleshy projections on the stem and lateral, ± pendulous, dark purple-black, rough flowers.
Not uncommon in rocky country and on dry cliff-faces. Like most members of this and neighbouring genera the flowers have an evil smell. HE, HT, HA, KIT, RV, NAN, MAC.
Tweedie 66/385; Bally 11402.

2. Huernia aspera *N. E. Br.*
Similar to the last species except for the smaller flowers.
Recorded from Nairobi Game Park in our area. NAN, NBI, KAJ.
Bally 514.

73. RUBIACEAE†

Trees, shrubs, or herbs, rarely climbers, with opposite or whorled, entire leaves; stipules present, fused between adjacent petioles; inflorescences usually cymose; flowers usually bisexual, with

† By A. D. Q. Agnew.

parts in fours, fives or sixes, regular; calyx tubular or with free teeth; corolla with a tube and free, contort, imbricate or valvate lobes; stamens usually epipetalous; ovary inferior, usually of 2 carpels with axile placentation and few to many seeds.

A family which mostly consists of trees and shrubs. Here no attempt is made to key out these for they are all dealt with in KTS. Amongst the herb genera only *Anthospermum* has shrubby representatives in Kenya.

1 Leaves in whorls of 4 or more, with the interpetiolar sheath obscure — 2
Leaves opposite or in whorls of 3 only, with the interpetiolar sheath evident, pointed or fringed — 3
2 Leaves sessile — 20. *Galium*
Leaves petiolate — 21. *Rubia cordifolia*
3 Flowers all axillary, sessile or subsessile with the pedicels and peduncle shorter than the stipular sheath — 4
Flowers axillary or terminal, if axillary then the pedicels or peduncles much longer than the stipular sheath — 8
4 Flowers unisexual — 14. *Anthospermum herbaceum*
Flowers bisexual — 5
5 Perennial herbs — 3. *Conostomium quadrangulare*
Annual herbs — 6
6 Fruits indehiscent, globular, free from the stipular sheath and falling entire — 10. *Paraknoxia parviflora*
Fruits dehiscent, retained within the stipular sheath — 7
7 Fruit dehiscent horizontally, the calyx falling entire, attached to a cap which is the top of the ovary — 19. *Mitracarpum*
Fruit dehiscent longitudinally, rarely horizontally as well — 17. *Borreria* and 18. *Arbulocarpus*
8 Climbing woody plant — 13. *Paederia pospischilli*
Erect or creeping herbs or shrubs — 9
9 Flowers pentamerous (parts in fives) — 10
Flowers tetramerous (parts in fours) — 18
10 Trailing or creeping plants — 11
Erect shrubs or herbs — 14
11 Glabrous herb with ± fleshy leaves — 7. *Pentodon pentandrus*
Hairy herbs with dry leaves — 12
12 Flowers solitary; leaves cordate — 16. *Geophila repens*
Flowers in spikes; leaves ovate or lanceolate — 13
13 Inflorescences axillary, rarely terminal, usually paired, peduncles longer than inflorescence — 11. *Pentanisia foetida*
Inflorescences terminal, solitary; peduncles shorter than inflorescence — 1. *Parapentas battiscombei*
14 Inflorescence terminal, elongating in fruit to look like a long spike — 9. *Otomeria*
Inflorescence terminal or axillary, if terminal then elongating into many spike-like inflorescences or not elongating — 15
15 Inflorescences terminal — 16
Inflorescences axillary — 17
16 Fruits indehiscent; herbs seldom over 50 cm tall; corolla tube never over 22 mm long — 11. *Pentanisia*
Fruits dehiscent; herbs often over 50 cm tall; corolla tube frequently over 25 mm long — 8. *Pentas*
17 Soft trailing herb with paired, axillary, spike-like inflorescences; leaves ± glabrous below — 11. *Pentanisia foetida*
Erect perennial herb with short, axillary, pedicellate cymes; leaves white-woolly below — 12. *Fadogia cienkowskii*
18 Inflorescences terminal — 20
Inflorescences all axillary or flowers solitary axillary — 19
19 Corolla tube over 2 cm long — 3. *Conostomium*
Corolla tube less than 1 cm long — 4. *Oldenlandia*
20 Flowers in a flat- or round-topped head or corymb — 21
Flowers solitary or at various levels on the erect elongated flowering branches — 2. *Kohautia*
21 Plant entirely glabrous — 6. *Dibrachionostylus kaessneri*
Plant hairy at least at nodes — 22
22 Herb with erect ± unbranched stems ending in a solitary head; heads globose, mostly over 2 cm in diameter — 5. *Agathisanthemum globosum*
Trailing herbs or erect much branched wiry herbs with heads less than 2 cm in diameter, or flowers corymbose — 23
23 Heads flat-topped, surrounded by spreading upper leaves; fruit of 2 indehiscent mericarps, each containing one seed — 15. *Richardia braziliensis*
Heads rounded or flowers corymbose, not surrounded by uppermost leaves; fruit a many-seeded capsule — 4. *Oldenlandia*

1. PARAPENTAS *Brem.*

Creeping herbs with entire leaves; flowers sessile, few, in terminal or axillary cymes, pentamerous,

isostylous or heterostylous; corolla with a long narrow tube and spreading lobes; fruit not beaked, dehiscing within the calyx.

Parapentas battiscombei *Verdc.*

A creeping herb with broad ovate or deltoid leaves and small terminal heads of lilac flowers.

Only known from the shady forest floor of the Mt. Kenya forests. HK, HN.

Polhill and Verdcourt 283.

2. KOHAUTIA *Cham. & Schlecht.*

Herbs with entire leaves and laciniate stipules; flowers in loose terminal monochasial or dichasial cymes; corolla tube cylindrical, 4-lobed, exceeding anthers; stigmas fused or free, shorter than the anthers; fruit ± globose, crowned with the 4 persistent sepals.

1 Plant annual, scabrid on peduncles and fruits 2
 Plants mostly perennial, shrubby at base, not scabrid on peduncles and fruits 3
2 Corolla (including the lobes), less than 5 mm long, pale blue or white 1. *K. aspera*
 Corolla (including the lobes) more than 6 mm long, bright red 2. *K. coccinea*
3 Corolla tube usually more than 8 mm long; stigmas 2, filiform, free 3. *K. caespitosa*
 Corolla tube less than 6 mm long; stigmas fused together 4. *K. virgata*

1. Kohautia aspera (*Roth*) *Brem.*

A small scabrid erect annual, often branched from the base, with linear leaves and minute bluish-white flowers, often in subsessile pairs.

Uncommon plant found in dry country. NAN, EMB, MAC, NBI, KAJ.

Verdcourt 3175; Agnew 7294.

2. Kohautia coccinea *Royle* (see p. 399)

Similar to *K. aspera* but usually unbranched and with larger, red flowers.

In dry grassland. HE, HC, HT, HM, HK, KIT, KIS, RV, MAC, NBI, KAJ.

Verdcourt 530; Strid 3211.

3. Kohautia caespitosa *Schnizl.*

A sparsely pubescent perennial or annual, usually branched below, with linear to elliptic leaves and pink, reddish-brown or orange flowers with long tubes.

Locally common in dry country and at the coast on shallow soils over rock. KIT, BAR, RV, MAG, MAC, KAJ.

Napper 748; Harmsen 645.

4. Kohautia virgata (*Willd.*) *Brem.*

Similar to *K. caespitosa* but smaller and with shorter flowers with entire stigma.

Rare plant found on shallow soils around Ruiru and Thika and, like *K. caespitosa*, also found at the coast. MAC.

Napier 380; Agnew 10051.

3. CONOSTOMIUM *Cuf.*

Erect perennial herbs with entire leaves and dentate stipular sheaths; flowers solitary axillary, isostylous, tetramerous; calyx teeth ± subulate; corolla with a very long, cylindrical tube; fruit subglobose, with a pronounced beak, dehiscing above, many-seeded.

1 Leaves lanceolate, sessile, clasping at base; flowers sessile 1. *C. quadrangulare*
 Leaves linear, sessile, not clasping at base; flowers pedicellate 2
2 Calyx lobes ± as long as the ovary at anthesis; corolla tube to 3·3 cm long 2. *C. keniense*
 Calyx lobes twice as long as the ovary at anthesis; corolla tube to 4·5 cm long 3. *C. floribundum*

1. Conostomium quadrangulare (*Rendle*) *Cuf.* (see p. 402)

An erect, sparsely pilose woody herb with sessile lanceolate leaves and sessile cream or white flowers with a very long corolla tube (to 12 cm).

Rare plant found in dry rocky bushland. BAR, NAN.

Adamson 6929.

2. Conostomium keniense *Brem.*

An erect shrub, pubescent except on the stems, with linear leaves and shortly pedicellate white flowers.

Rare plant found in dry rocky country. MAC.

Archer 88; Bally 8374.

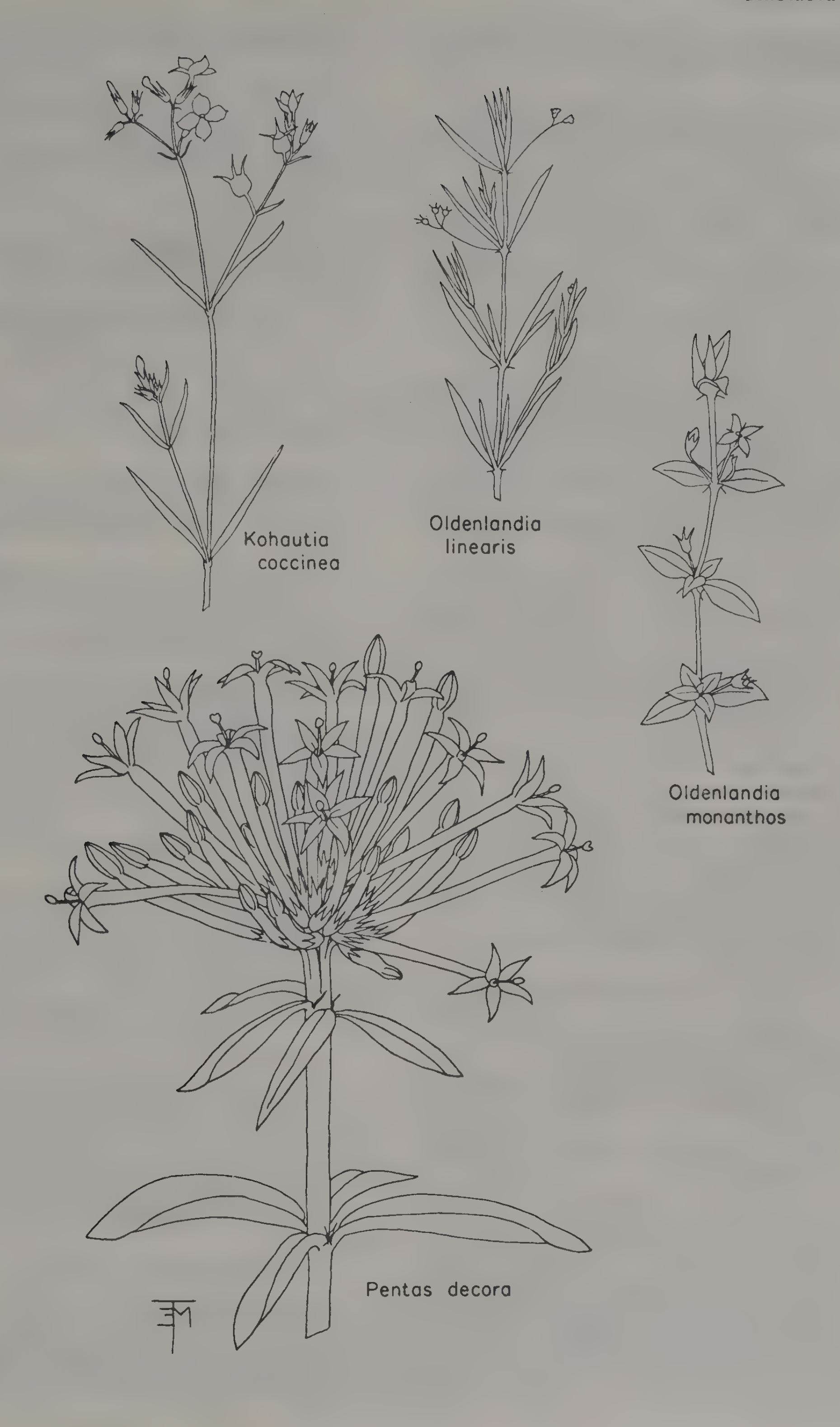
3. Conostomium floribundum *Brem.*

Similar to *C. keniense* except for the key characters, and similarly rare, found in dry rocky country. BAR.

Bally 8374.

4. OLDENLANDIA *L. emend Brem.*

Erect or creeping herbs or low shrubs with entire leaves and laciniate interpetiolar sheaths; flowers axillary or terminal in cymes, isostylous or heterostylous, tetramerous; calyx of small teeth; corolla with a ± obconical tube, white, pink, or


Kohautia coccinea
Oldenlandia linearis
Oldenlandia monanthos
Pentas decora

purple, never red (in ours); style divided into two stigmas, or stigma globose; seeds many.

1 Leaves broad, ovate or oblong, less than 6 times as long as wide, usually abruptly narrowed at the petiole, obtuse or acute at apex 2
Leaves narrow, linear to linear-elliptic, more than 6 times as long as wide, always gradually narrowed at base, with a very acute apex 6
2 Flowers numerous, whorled, sometimes terminal, exceeded by the leaves; stigma subglobose 3
Flowers terminal, exceeding the subtending leaves, or, if axillary then only 1-4 together, with long pedicels; stigma elongated 4
3 Some pedicels over 3 mm long; corolla exceeding the calyx 1. *O. bullockii*
All pedicels under 3 mm long; corolla shorter than or equalling the calyx 2. *O. goreensis*
4 Flowers solitary or 1-2 together on long axillary pedicels 3. *O. monanthos*
Flowers in small cymose inflorescences 5
5 Flowers in few-flowered cymes on long peduncles 4. *O. johnstonii*
Flowers crowded in cymes with the peduncles suppressed and thus appearing umbellate 5. *O. friesiorum*
6 Flowers subcapitate in dense, terminal, pedunculate inflorescences 6. *O. wiedemannii*
Flowers in axillary cymes or solitary 7
7 Plant creeping and rooting at nodes, with scarcely branched stems 8
Plant erect, not rooting at nodes 9
8 Flowers solitary 7. *O. lancifolia*
Flowers in groups of 4 or more 11. *O. fastigiata*
9 Corolla over 3 mm long 10
Corolla less than 2 mm long 11
10 Flowers solitary or in pairs at the nodes with no peduncle and with a long, capillary pedicel 8. *O. herbacea*
Flowers in small, 3-7-flowered, pedunculate, axillary cymes 9. *O. scopulorum*
11 Fruits held on ± straight pedicels, always reaching beyond half the leaf length, sometimes exceeding the leaves; fruits solitary or in pairs 10. *O. corymbosa*
Fruits held on recurved pedicels close to the stem, reaching to half way along leaves; fruits in groups of 2-many 12
12 Fruits in groups of 4-many 11. *O. fastigiata*
Fruits in groups of 2-3 12. *O. acicularis*

1. Oldenlandia bullockii *Brem.* (*O. verticillata* Brem.)

A creeping plant, rooting at the nodes, with rhomboid to almost cordate, shortly petiolate leaves and pale pink flowers.

Very rare and only found once in a marsh in Kipkarren. KIT.

Brodhurst-Hill 349.

2. Oldenlandia goreensis (*DC.*) *Summerhayes*

Procumbent herb with erect stems, very similar to *O. bullockii* except for the key characters.

Rare plant found in swampy ground and only once recorded, from near Kitale. KIT.

Bogdan 4213.

3. Oldenlandia monanthos (*A. Rich.*) *Hiern* (see p. 399)

A creeping, mat-forming herb, rooting at the nodes, with lanceolate to oblong leaves and solitary or paired pink-purple flowers on long pedicels.

Locally common in montane grassland, especially along pathsides and often on shallow soil. HE, HC, HT, HM, HA, HK, KAJ.

Tweedie 67/160; Kerfoot 3918.

4. Oldenlandia johnstonii (*Oliv.*) *Engl.*

A low trailing plant, sometimes shrubby at base, with ascending stems, and ovate to elliptic leaves; flowers pedicellate, white, 3-5 together on a long peduncle.

Locally common in dry forest edges, especially near Nairobi. HA, NBI.

Verdcourt 518; Agnew 7806.

5. Oldenlandia friesiorum *Brem.*

A low trailing herb with ascending stems and broad-ovate leaves; flowers clustered in terminal pseudo-umbels, pale pink.

Rare plant found in montane forest edges. HA, HK.

Lucas, Polhill, and Verdcourt 5.

6. Oldenlandia wiedemannii *K. Schum.*

An erect much-branched pubescent annual or weak perennial herb or wiry shrub with linear leaves and pale flowers in terminal clusters.

One of the commonest *Oldenlandia* species in dry bushland on shallow, rocky soil. RV, MAC, MAG, KAJ.

Verdcourt 3674; Agnew 10087.

7. Oldenlandia lancifolia (*Schum.*) *DC.*

Annual herb with trailing ascending unbranched stems, linear leaves and white, solitary, long-pedicellate flowers.

Rare plant found on shallow sandy soils in wooded grassland. KIT, MAC.

Faden 67/277.

8. Oldenlandia herbacea (*L.*) *Roxb.*

An erect, much-branched, glabrescent annual with linear leaves and solitary white flowers on slightly ascending pedicels.

In stony, open soil of dry grassland country. This plant dries black and is easily recognized. HT, HM, HA, HK, KIT, MUM, RV, EMB, MAC, NBI, KAJ.

Ryan 823; Agnew and Hanid 8369.

9. Oldenlandia scopulorum *Bullock*

An erect, much-branched, glabrescent shrubby short-lived perennial or annual with linear leaves and small cymes of white, lilac, or bluish-pink flowers.

Common in medium-altitude grassland. HT, HM, HL, HA, KIT, NAR, RV, NAN, NBI.

Glover 503; Agnew 10177.

10. Oldenlandia corymbosa *L.* (incl. *O. caespitosa* Hiern. and *O. linearis* DC.) (see p. 399)

An erect, sparsely-branched, annual herb with linear leaves and one or two white flowers on pedicels and peduncles which together often equal the leaves and tend to nod in fruit.

When the flowers are all single, this species resembles *O. herbacea*, but it has smaller flowers and does not dry black. Occasional, on shallow soils and sand in drier areas. HE, HA, KIT, MUM, BAR, RV, EMB.

Verdcourt 2458; Agnew 7480.

11. Oldenlandia fastigiata *Brem.*

An erect, sometimes large, sparsely-branched annual with linear leaves and minute flowers on short pedicels in clusters at the nodes.

Uncommon plant found in dry country and at the coast. MAG, MAC, KAJ.

Verdcourt 1870; Agnew 9853.

12. Oldenlandia acicularis *Brem.*

Very similar to *O. fastigiata* except for the smaller number of flowers.

This species is still known only from the type collected at Kipkarren, and may turn out to be only a form of *O. fastigiata*. KIT.

Brodhurst-Hill 221.

5. AGATHISANTHEMUM *Klotzsch*

Perennial herbs with entire leaves and laciniate stipules; flowers in terminal ± dense corymbs, tetramerous, isostylic or heterostylic; sepals with long lobes; corolla with a tube ± shorter than the lobes; style single; stigmas subglobose; capsule without a beak, loculicidal and septicidal, many-seeded.

Agathisanthemum globosum (*A. Rich.*) *Hiern* (see p. 402)

A tomentose and scabrid perennial herb with many erect unbranched stems bearing lanceolate leaves and a terminal ± globose head; flowers purplish.

A tall herb, rare in wooded grassland in western Kenya. HC, HT, KIT.

Verdcourt 3212; Tweedie 66/116.

6. DIBRACHIONOSTYLUS *Brem.*

Perennial glabrous herbs with entire leaves and toothed stipular sheaths; flowers in dense terminal cymose corymbs; flowers with a short tube, heterostylous; style simple, glabrous dividing at apex into 2 ellipsoid stigmas, linear; capsule loculicidal and septicidal, with many seeds.

Dibrachionostylus kaessneri (*S. Moore*) *Brem.*

An erect glabrous weak shrub or woody herb with linear-elliptic leaves and dense corymbs of pale mauve flowers.

Common in vlei grassland (seasonally water-logged) around Nairobi. EMB, MAC, NBI.

Harmsen 6415; Ward in EAH 5629.

7. PENTODON *Hochst.*

Erect or trailing glabrous herbs with simple leaves and toothed stipular sheaths; flowers in axillary or terminal cymes, pedicellate, isostylous or heterostylous, pentamerous with a short tube and lobes; calyx of triangular teeth; corolla blue or white; style single, with 2 filiform stigmas; capsule dehiscing within the calyx, many-seeded.

Pentodon pentandrus (*Schum.*) *Vatke*

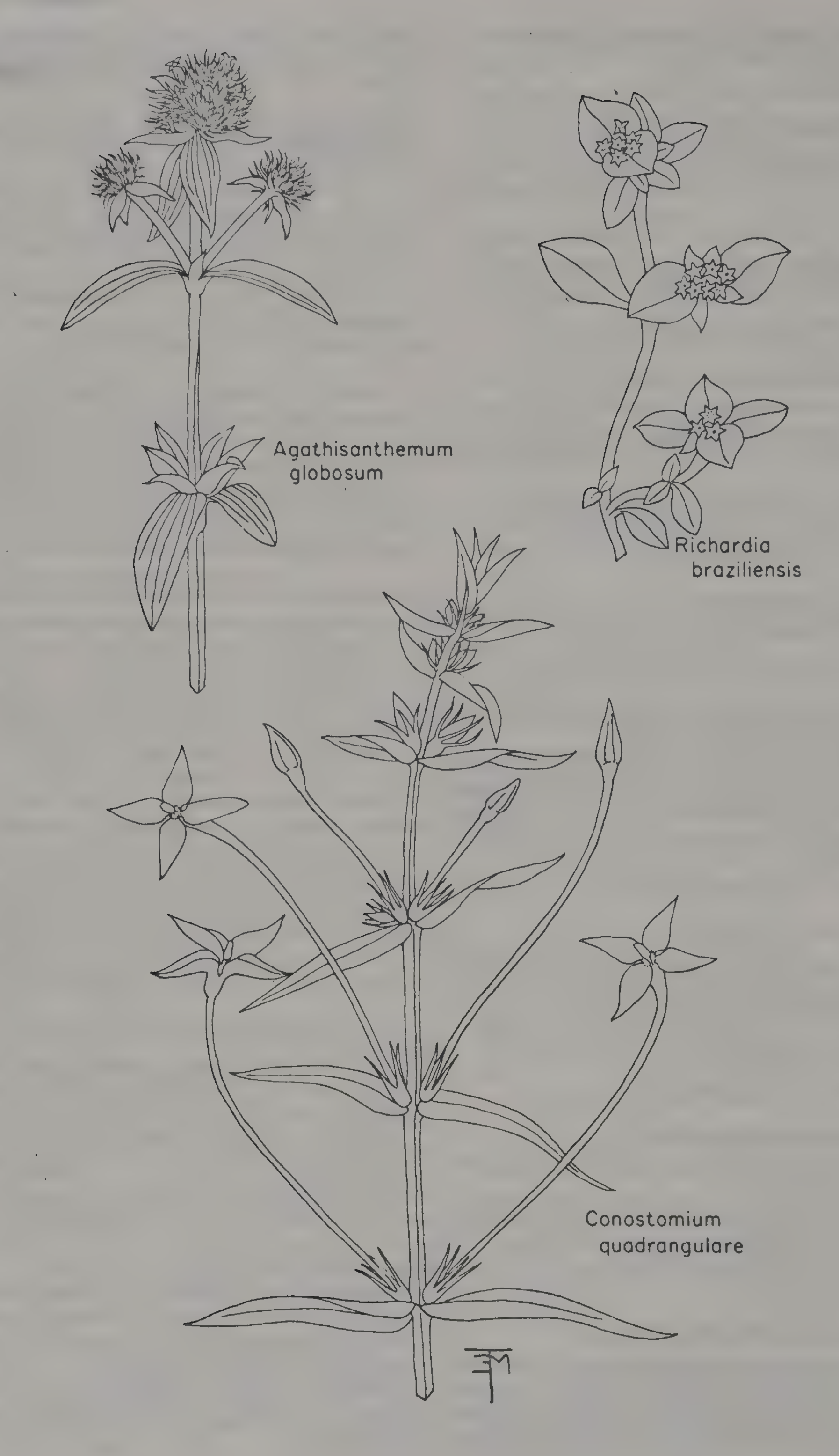
A trailing, often large perennial with lanceolate, often glaucous and ± fleshy leaves, and loose axillary cymes of blue flowers.

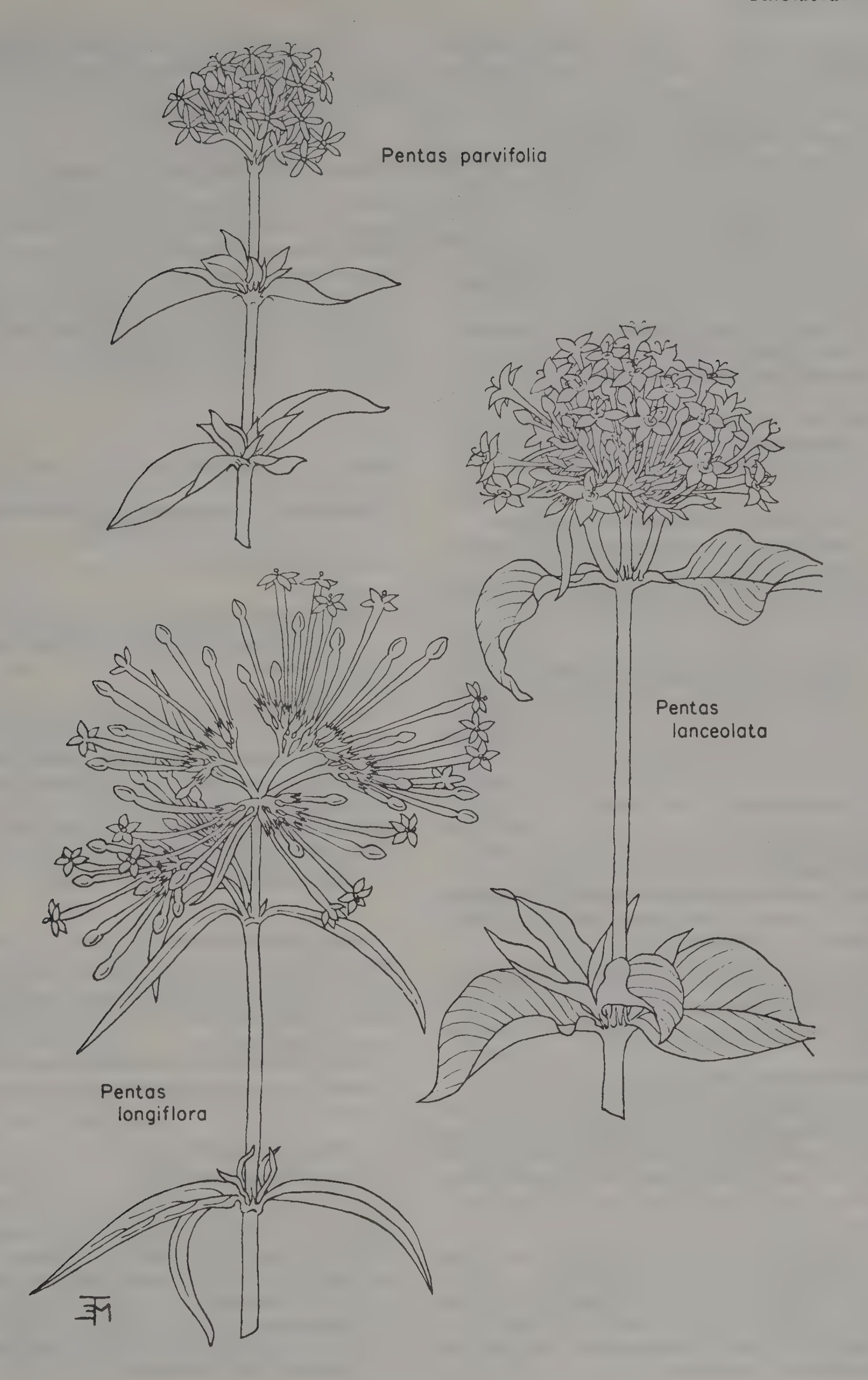
Locally common along the shore of Lake Victoria, this species is also found at the coast. MUM, KIS, MAC.

Hanid and Kiniaruh 739; Ossent 616.

8. PENTAS *Benth.*

Erect herbs or shrubs with entire leaves and laciniate stipular sheaths; flowers isostylous or heterostylous, cymose in dense terminal corymbs; sepal lobes equal or unequal; corolla with a cylindrical tube, red, purple, or white; fruit a dry capsule, apically and often tardily dehiscent, many-seeded.


Agathisanthemum
globosum
Richardia
braziliensis
Conostomium
quadrangulare


Pentas parvifolia
Pentas lanceolata
Pentas longiflora

1 Flowers bright red 1. *P. parvifolia*
Flowers white, mauve, or pink, not bright red 2
2 Corolla tube more than 1 cm long 3
Corolla tube less than 1 cm long 7
3 Inflorescences 3-7-flowered; plant a trailing shrub 2. *P. hindsioides*
Inflorescences of more than 10 flowers; erect shrubs or herbs 4
4 Calyx lobes linear or subulate, subequal 5
Calyx lobes very unequal, some oblong or ovate more than twice the size of others 6
5 Corolla tube more than 5 cm long at least in some flowers 3. *P. decora*
Corolla tube always less than 4 cm long 4. *P. longiflora*
6 Corolla tube more than 5 cm long at least in some flowers 5. *P. suswaensis*
Corolla tube always less than 5 cm long 6. *P. lanceolata*
7 Calyx lobes linear or subulate, subequal 8
Calyx lobes very unequal, some oblong or elliptic twice the length of others 9
8 Many-stemmed herb; inflorescence exceeding the leaves and without leaf-like bracts 7. *P. arvensis*
Single- or few-stemmed tall woody herb or weak shrub; inflorescence not exceeding the leaves and often with leaf-like bracts 8. *P. schimperana*
9 Corolla tube less than 5 mm long 9. *P. pubiflora*
Corolla tube 6-10 mm long 10. *P. zanzibarica*

1. Pentas parvifolia *Hiern* (see p. 403)

An erect pubescent shrub with elliptic-lanceolate leaves and dense or lax corymbose heads of bright red flowers; corolla tube 8-14 mm long.

Common in dry bushland and wooded grassland, especially with *Combretum*. MUM, BAR, EMB, MAC, NBI, KAJ.

Agnew 9878; Verdcourt 3641.

2. Pentas hindsioides *K. Schum.*

A trailing shrub with ovate to elliptic leaves and white flowers with the corolla tube 3-4 cm long.

Rare plant found on cliff faces. This species is found in Northern Tanzania and Teita but has only been found once in our area, at Nzaui. MAC.

Agnew and Hanid 8356.

3. Pentas decora *S. Moore* (see p. 399)

An erect-stemmed woody herb with often trifoliate lanceolate-elliptic leaves; flowers in a solitary dense head, white or cream, with the corolla tube 5-7 cm long.

Uncommon plant found in wooded tall-grassland, in western Kenya. HE, HC, KIT, MUM, BAR.

Strid 2895; Leippert 5172.

4. Pentas longiflora *Oliv.* (see p. 403)

Similar to *P. decora* in general appearance, but leaves opposite, and with a lax inflorescence of several separate corymbs; corolla tube 2·5-4 cm long, cream.

Locally common in dry wooded grassland, often with *Combretum*. HE, HC, HT, HM, HA, KIT, MUM, KIS, NAR, RV, KAJ.

Agnew and Hanid 8404; Bally 661.

5. Pentas suswaensis *Verdc.*

Similar to *P. lanceolata* except for the longer, white flowers.

This endemic species is so far only known from Mt. Suswa in the Rift Valley. RV.

Verdcourt 710.

6. Pentas lanceolata (*Forsk.*) *Deflers* (see p. 403)

An erect branched shrub or woody herb with ovate-lanceolate leaves and mauve to white flowers in corymbs.

This very variable species is widespread in forest edges. There are two main population types, one that is dimorphic in its corolla tube length (as well as in the stamen and style length) and the other which is not. Occasionally these two may be found together. HE, HC, HA, HK, HN, KIT, MUM, KIS, NAR, RV, NAN, MAC, NBI, KAJ.

Hanid and Kiniaruh 979B; Ossent 167.

7. Pentas arvensis *Hiern*

An erect herb with many unbranched stems and elliptic leaves; flowers in a terminal corymb which overtops the stem leaves, white to pinkish; corolla tube 4-5 mm long.

Rare plant found in burnt grassland and only recorded from Kakamega in our area. MUM.

Carroll H8.

8. Pentas schimperana *Vatke*

An erect woody tomentose herb with unbranched stems and ovate leaves; inflorescence a dense terminal corymb, often with leafy bracts or overtopped by leaves; flowers cream to pink, with a tube 5-9 mm long.

Uncommon plant found in montane forest edges in west Kenya. HE, HC, HT, HM, HA.

Tweedie 67/310; Bush 258.

9. Pentas pubiflora *S. Moore* (see p. 406)

An erect herb with elliptic to lanceolate leaves and rather open terminal corymbs, with tiny white and pink flowers; corolla tube 4–5 mm long.

Uncommon, but widespread in montane forest and riverine forest. HE, HC, HT, HM, HA, HN, KIT, MUM, NAR, RV.

Tweedie 67/173; Kerfoot 4339.

10. Pentas zanzibarica (*Klotzsch*) *Vatke*

Similar to *P. lanceolata* except for its occasional rhizomes and shorter blue to purple-pink flowers.

Common in dry grassland especially in the Rift Valley. HT, HM, HL, HA, KIT, NAR, RV, NBI, KAJ.

Agnew, Hanid, and Kiniaruh 7822; Napier 467.

9. OTOMERIA *Benth.*

Very similar to *Pentas* except for the inflorescence which elongates in fruit.

1 Flowers scarlet, not dimorphic; style always exserted 1. *O. elatior*
Flowers pink or white with a blue or maroon eye in the centre; style dimorphic 2. *O. oculata*

1. Otomeria elatior (*DC.*) *Verdc.*

Herb with many erect unbranched stems and ovate-lanceolate leaves; corolla tube 17–27 mm long.

Rare plant found in swampy places in wooded grassland areas of western Kenya. HT, MUM, KIS.

Napier 5285.

2. Otomeria oculata *S. Moore*

Similar to *O. elatior* but with a dark-centred corolla.

Uncommon plant found in dry rocky grassland. BAR, NAN, EMB, MAC.

Williams in EAH 184162; Strid 2241.

10. PARAKNOXIA *Brem.*

Similar to *Oldenlandia* but with sessile flowers and solitary seeds in each luculus.

Paraknoxia parviflora (*Verdc.*) *Brem.* (see p. 406)

A small, divaricately branched, erect pubescent annual with oblong to linear leaves and axillary groups of sessile, white or blue flowers.

Rare plant found in short grassland in west Kenya. HE, KIT.

Verdcourt 2454; Tweedie 67/240.

11. PENTANISIA *Harvey*

Erect or decumbent annuals or perennials with simple leaves and fimbriate stipular sheaths; flowers in terminal or axillary corymbs or fascicles, dimorphic, pentamerous, often on very short pedicels; calyx with 1–3 lobes enlarged; corolla with a tube and spreading lobes, usually purple; fruit globular, indehiscent (occasionally succulent) with one compressed seed in each loculus.

1 Leaves and calyx glabrous; calyx-lobes up to twice ovary length 1. *P. schweinfurthii*
Leaves and calyx tomentose; calyx-lobes more than 3 times ovary length 2
2 Inflorescences of paired axillary pseudo-spikes, each up to 12-flowered 2. *P. foetida*
Inflorescences of solitary, terminal, more than 20-flowered corymbs 3. *P. ouranogyne*

1. Pentanisia schweinfurthii *Hiern* (see p. 406)

An erect subglabrous herb or low shrub, with elliptic leaves and terminal corymbs of blue-violet flowers.

Uncommon plant found in burnt wooded grassland in western Kenya. HC, KIT, MUM.

Bogdan 3719; Tweedie 66/1.

2. Pentanisia foetida *Verdc.*

An erect or trailing tomentose herb with ovate leaves and purple flowers on paired, pedunculate pseudo-spikes.

Common in some areas of montane rain-forest in the Aberdares and Mt. Kenya especially just below and in the bamboo zone. HA, HK, HN.

Rayner 510 A: Agnew 8315.

3. Pentanisia ouranogyne *S. Moore* (see p. 406)

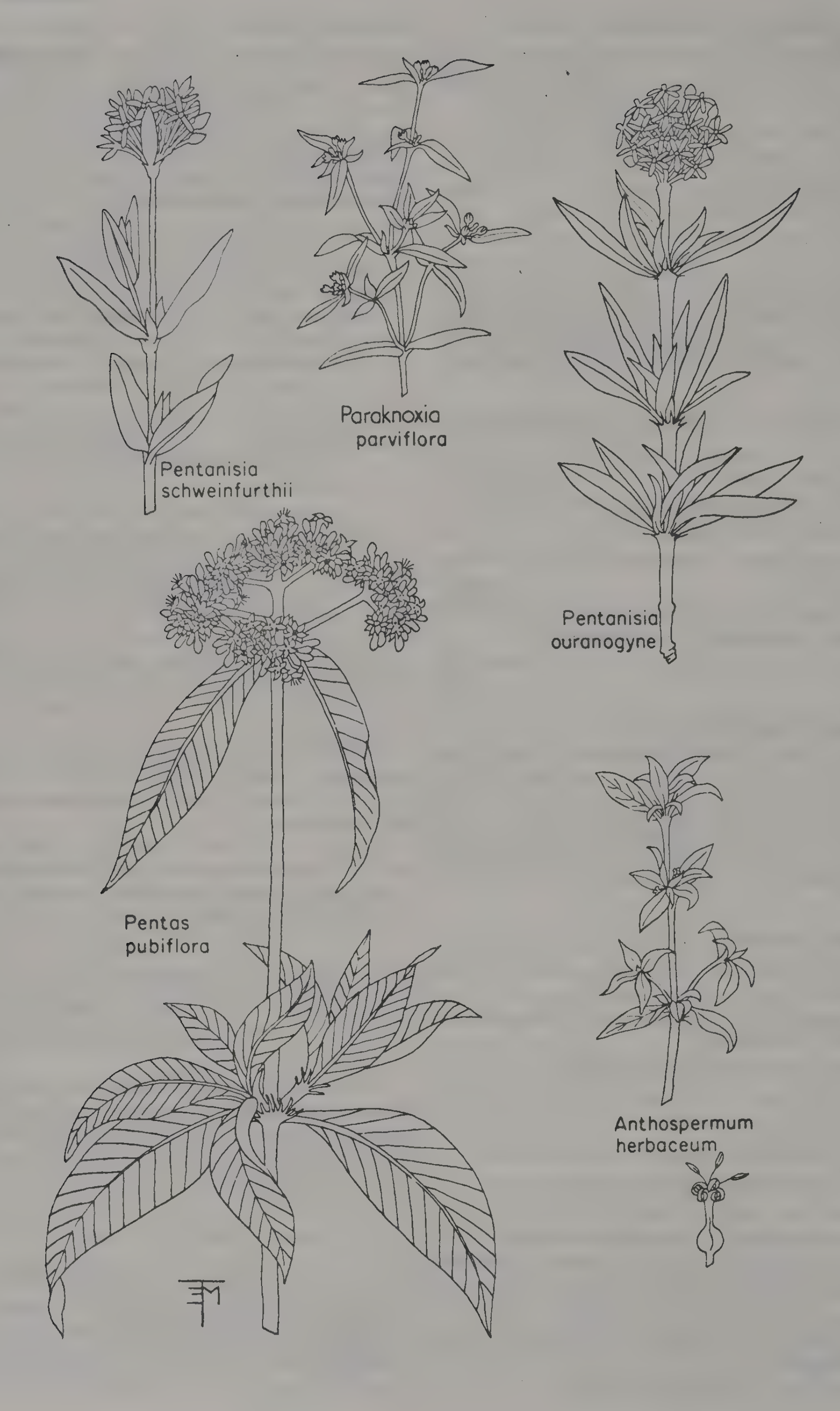
A rhizomatous low tomentose herb with linear to lanceolate leaves and terminal corymbs of bright blue flowers.

This very ornamental plant is abundant in disturbed places in dry country and so is often seen along roadsides. HE, HT, HK, KIS, NAR, BAR, RV, MAG, NAN, MAC, NBI, KAJ.

Lind, Agnew, and Beecher 5718.

12. FADOGIA *Schweinf.*

Herbs, shrubs, or trees with whorled leaves and entire, acute stipules; flowers axillary or in short panicles or clusters, pentamerous, isostylous; calyx with small equal teeth; corolla funnel-shaped or subcylindrical, hairy within; ovary 3–5-celled with 1 ovule in each cell; fruit a drupe of bony sections.



Pentanisia
schweinfurthii
Paraknoxia
parviflora
Pentanisia
ouranogyne
Pentas
pubiflora
Anthospermum
herbaceum

Fadogia cienkowskii *Schweinf.* (see p. 408)

An erect weak shrub or woody herb with trifoliolate leaves densely tomentose below; flowers yellow, axillary, short-pedicellate, solitary or pedunculate in cymes of 3–5.

Uncommon plant found in wooded tall grassland in western Kenya. KIT.

Symes 50; Tweedie 66/75.

13. PAEDERIA *L.*

Climbing, twining woody lianes with opposite (in our plant), or often whorled leaves with minutely bifid stipules; isostylous, pentamerous; calyx of 5 equal teeth; corolla funnel-shaped, with a spreading lobed limb; fruit with one seed in each of the two cells, splitting into 2–3 pyrenes.

Paederia pospischilii *K. Schum.*

A foetid-smelling pubescent twiner with lanceolate to sub-orbicular petiolate leaves and solitary flowers; flowers with a pink tube and white flat limb.

Rare plant found in *Commiphora* bushland. MAC, KAJ.

Agnew 9802; Bally 1342.

14. ANTHOSPERMUM *L.*

Dioecious or monoecious shrubs or herbs with opposite or whorled simple leaves with toothed stipular sheaths; flowers unisexual, mostly tetramerous; calyx of equal or unequal lobes; ovary 2-celled, with one ovule in each cell, and with a style bearing two linear stigmas; fruit of two 1-seeded mericarps.

Other Kenya species are shrubs.

Anthospermum herbaceum *L. f.* (see p. 406)

A low, trailing, dioecious or monecious herb not rooting at the nodes with ovate-lanceolate leaves and minute yellowish flowers.

Found in hedgerows and short grass in the wet forest areas. HE, HC, HT, HM, HA, HK, KIT, KIS, KAJ.

Verdcourt 1046; Hanid 231.

15. RICHARDIA *Adans.*

Trailing perennial herbs with entire leaves; flowers white, sessile in heads subtended by uppermost leaf-pairs; calyx of broad, deltoid lobes of differing sizes; corolla with a short tube; fruit mericarpic into 3, 1-seeded cocci.

Richardia braziliensis *Gomez* (see p. 402)

A trailing pubescent perennial herb with swollen roots; leaves elliptic to spathulate, except those of the involucre which clasp at the base; fruits with a broad face between the mericarps.

Introduced from South America, this weed is found in short grassland such as lawns. HA, KIT, MAC, NBI.

Faden 67214; Strid 2592.

16. GEOPHILA *D. Don*

Creeping herbs, rooting at the nodes, with cordate, entire leaves; flowers small, axillary, in groups of 1–4; corolla with a bearded throat and 5 petal lobes; stamens 5, inserted or included; fruit of 2 1-seeded drupes.

Geophila repens (*L.*) *I. M. Johnst.*

A creeping pubescent herb with orbicular-cordate or reniform leaves and small white flowers; fruit red.

Recorded only recently from Kakamega forest in grassy pathsides. MUM.

Record from Faden *in litt.*

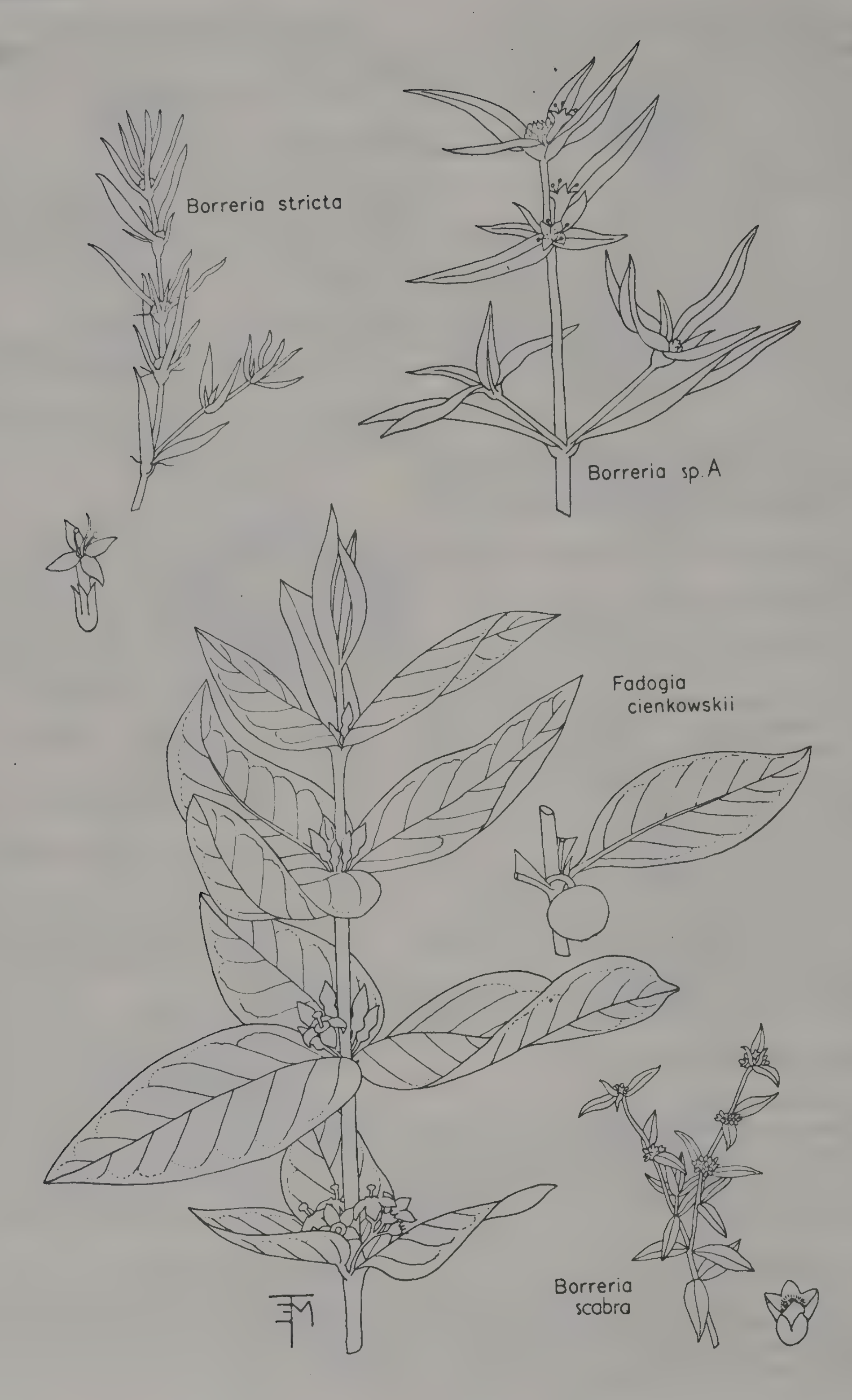
17. BORRERIA *G. F. W. Mey.*

Annual or perennial herbs with entire leaves and fringed stipular sheaths; flowers sessile in axillary clusters in the inflated stipular sheath, tetramerous, isostylic, white or pink; calyx of similar or dissimilar lobes; ovary with a single style and 2-lobed globose stigma; fruit a capsule, dehiscing at the apex to liberate the two seeds.

1 Plant perennial, either creeping or from a woody rootstock — 2
 Plant annual, erect — 3
2 Plant creeping; leaves more than 2·5 cm long — 1. *B. princei*
 Plant erect from a woody rootstock; leaves less than 2·5 cm long — 2. *B.* sp. *A*
3 Calyx lobes more than 2 mm long, overtopping the teeth on the stipular sheath — 5
 Calyx lobes less than 2 mm long, overtopped by the teeth on the stipular sheath — 4
4 Leaves hairy below — 3. *B. kotschyana*
 Leaves glabrous below — 4. *B. stricta*
5 Calyx lobes very unequal, 2 very big and 2 minute, less than one quarter the size of the others; capsule dehiscent at apex, the valves persistent — 5. *B. scabra*
 Calyx lobes ± equal; capsule dehiscent at base, the valves falling entire leaving the conspicuous white placenta — *Arbulocarpus sphaerostigma*

1. Borreria princei *K. Schum.*

A trailing, pubescent perennial, rooting at the nodes, with elliptic leaves; leaves deeply impressed with ± parallel nerves on the upper side; flowers few, white.


Borreria stricta
Borreria sp. A
Fadogia cienkowskii
Borreria scabra

Common in hedgerows and forest edges in wet country below 8000 ft. HC, HT, HA, HK, KIT, KIS, NAR, MAC.
Agnew 8205; Verdcourt 2465.

2. Borreria *sp.* **A.** (see p. 408)

An erect, branching, wiry, almost glabrous herb from a woody rootstock, with elliptic leaves and dense clusters of white flowers.
Uncommon plant found in short grass in wooded grassland in western Kenya. HE, HC, HM, HT, KIT.
Tweedie 66/15; Symes 38.

3. Borreria kotschyana (*Oliv.*) *K. Schum.*

An erect pubescent annual, branched below, with linear-elliptic leaves and dense ± globose clusters of small cream flowers, amongst which filiform bracts are evident.
Rare plant found in disturbed places in dry country. BAR.
Bogdan 5605.

4. Borreria stricta (*L. f.*) *G. F. W. Mey.* (see p. 408)

Similar to *B. kotschyana* but more slender, glabrous except for the stipular sheaths, and with the filiform bracts not reaching to the flowers.
Common as a field weed in western Kenya and in dry country. HE, KIT, MUM, MAC, KAJ.
Agnew and Musumba 8586; Tweedie 67/230.

5. Borreria scabra (*Schumach. & Thonn.*) *K. Schum.* (see p. 408)

An erect pubescent annual, branched below, with linear-elliptic leaves and semiglobose heads of white flowers in the stipular sheaths; calyx with 2 very long sepals (to 6 mm) and 2 less than 1 mm long.
Rare plant found in dry country, recorded from East Tsavo and by one specimen from Thika District. MAC.
Hanid and Kiniaruh 471; Greenway 9772.

18. ARBULOCARPUS *Tennant*

Similar in all respects to 17. *Borreria* except for the dehiscence of the capsule which is from the base, so that the valves fall, exposing the placenta.

Arbulocarpus sphaerostigma (*A. Rich.*) *Tennant*

An erect, often scabrid-pubescent, annual, branching from the base, with elliptic leaves and hemispherical clusters of white flowers in the stipular sheaths; calyx lobes subequal.
A field weed in grassland, particularly in western Kenya. HE, HC, HT, KIT, KIS, MAC.
Nattrass 987; Strid 2496.

19. MITRACARPUM Zucc.

Erect herbs with entire leaves and laciniate stipular sheaths; flowers clustered at the nodes, isostylous, bisexual tetramerous; calyx with 4 teeth, alternately long and short; corolla bell-shaped; ovary with a single style and two slender stigmas; fruit a capsule of 2 cells with one seed in each, dehiscing transversely with the top and stiff persistent calyx lobes lifting off like a cap.

Mitracarpum verticillatum (*Schum. and Thonn.*) *Vatke* (*M. scaber* Zucc.)

An erect annual with oblong to elliptic leaves and hemispherical clusters of untidy-looking white flowers at the nodes.
Rare plant found in waste places in warmer, wetter districts. This plant is common in Tanzania and Uganda but curiously little-known in Kenya. MUM.
Drummond and Hemsley 4486.

20. GALIUM *L.*

Annual or perennial herbs with whorls of 4–10 entire leaves and often retrorse barbs; inflorescence cymose; flowers bisexual, isostylous, tetramerous; calyx obsolete; corolla of 4 valvate deltoid segments and a very short tube; styles 2, joined below; fruit of 2 dry, 1-seeded mericarps, or a berry with the seed adherent to the ovary wall.

1 Leaves always only 4 at each node, orbicular to broad-elliptic, 3-nerved
 1. *G. thunbergianum*
 Leaves more than 4 at each node, narrow-elliptic to linear, 1-nerved 2
2 Retrorse prickles present on the stem and frequently but not always also on the leaf edges (these may be discovered by the 'sticky' feel of the stem when rubbed upwards); fruits glabrous or hairy 3
 Retrorse prickles absent from the glabrous or hairy stem (and leaves) which feel smooth; fruits always glabrous 9
3 Fruit glabrous 4
 Fruit hairy 6
4 Flowers in corymbose terminal cymes which overtop the leaves; fruit dry when ripe
 11. *G. scioanum*
 Flowers in small irregular cymes which are not corymbose, mostly lateral, and hardly overtop the leaves; fruits fleshy 5
5 Leaves up to 15 mm long, each with a tuft of hairs at the base; stem usually minutely pubescent under the prickles
 2. *G. ruwenzoriense*


Galium scioanum
Galium thunbergianum
Rubia cordifolia
Galium simense

Some leaves more than 15 mm long, with a tuft of pale brown to colourless hairs at the base; stem glabrous under the prickles 3. *G. simense*

6 Fruits covered with yellow hooked bristles, each fruit often ± sessile and subtended by a small leafy bract 7

Fruits covered with white hooked or straight bristles, each fruit pedicellate 8

7 Prickles on leaf-margin retrorse, pointing towards the base of the leaf 4. *G. chloroionanthum*

Prickles on leaf margin not retrorse but pointing towards the leaf-apex 5. *G.* sp. *A*

8 Most fruits solitary, or 2–3 together, axillary, on long pedicels 6. *G. spurium*

Most fruits in small terminal inflorescences, held on short pedicels 7. *G. aparinoides*

9 Leaves with a terminal acute tip ending in a bristle 10

Leaf obtuse or acute at tip but without a terminal bristle 11

10 Creeping herb with scattered flowers and ± spathulate leaves less than 5 mm long 8. *G. glaciale*

Erect-stemmed herb with terminal inflorescences and linear leaves often over 5 mm long 9. *G. ossirwaense*

11 Leaves less than 5 mm long; flowers scattered 10. *G. kenyanum*

At least some leaves over 10 mm long; flowers mostly terminal 11. *G. scioanum*

1. Galium thunbergianum *Eckl. and Zeyh.* (see p. 410)

A creeping tomentose herb with quadrifoliate suborbicular leaves and loose cymes of pale yellow flowers; fruit covered with straight glossy hairs.

Rare plant found in wet montane forest. HE, HM, HK.

Agnew and Coe 8754.

2. Galium ruwenzoriense (*Cort.*) *Chiov.*

'Sticky' climber with linear leaves and small axillary inflorescences; fruits glabrous, becoming black and fleshy.

Common above 7500 ft on all our three great mountains, on forest edges and bushland. HE, HA, HK.

Hedberg 1025; Hanid 123.

3. Galium simense Fres. (see p. 410)

Similar to *G. ruwenzoriense*, but larger in all its parts and differing in the key characters. These two species may turn out to be altitudinal forms of the same.

Rather rare plant found in bushland edges between 5000 and 6500 ft. NAR, RV, HA.

Agnew, Hanid, and Kiniaruh 7885; Verdcourt 634.

4. Galium chloroionanthum *K. Schum.*

'Sticky' climber or scrambler with elliptic leaves rounded at apex, and axillary cymes of sessile, bracteate flowers; fruits covered with brown hooks.

Apparently very rare and only found in HM.

Bally 4891.

5. Galium *sp.* **A.**

Similar to *G. chloroionanthum* but often creeping and without the retrorse bristles on the leaf margin.

This species may be but a form of *G. chloroionanthum* since it is found in the same areas, in deep, wet montane forest and bamboo where it creeps on the forest floor. HM, HA.

Kerfoot 665; Agnew 7132.

6. Galium spurium *L.*

A 'sticky' climber or scrambler with narrowly oblanceolate, acute leaves and usually solitary axillary flowers on long pedicels; pedicels sharply bent below the hairy fruit.

A rather uncommon weed of cultivation. HC, HT, HM, HA, NBI.

Bogdan 1931; Agnew 8991.

7. Galium aparinoides *Forsk.*

Similar to *G. spurium* but the leaves broader, rounded, apiculate at tip, and flowers mostly in terminal inflorescences.

Locally common in montane forest edges. HC, HM, HA, HK, KIT, KAJ.

Glover 1471; Agnew 8881.

8. Galium glaciale *K. Krause*

Prostrate glabrous creeper from central rootstock with spathulate, acuminate leaves and scattered flowers; fruits glabrous, dry.

Uncommon plant found in disturbed places along river banks etc, in the alpine zone. HE, HK.

Hanid 93; Hedberg 1733.

9. Galium ossirwaense *K. Krause*

A rhizomatous, sparsely pubescent herb with tufted ascending stems and linear leaves; flowers yellow, crowded towards the stem apex; fruits glabrous, dry.

Uncommon plant found in dry grassland. HT, HA, HK.

Napper 536; Strid 2132.

10. Galium kenyanum *Verdc.*

A trailing herb, glabrous except for sparse hairs on young parts, with linear-oblong leaves and scattered flowers; fruits glabrous, dry.

Uncommon plant found in alpine grassland. HA, HK.

Coe 364; Polhill 239.

11. Galium scioanum *Chiov.* (see p. 410)

A trailing herb with narrow-elliptic leaves and flowers in ± terminal corymbose cymes; fruits glabrous, dry.

Found in swamps and moist woodland mostly in Western Kenya, this species exists in two forms, one almost glabrous except for the nodes, the other sparsely tomentose on stems and below the leaves. HC, HM, HT, HA, KIT.

Tweedie 67/166; Symes 108.

21. RUBIA *L.*

Perennial climbing herbs, sometimes woody below with 4–6 entire leaves in each whorl; flowers as in *Galium* but pentamerous; fruit a berry, usually derived from only 1 carpel; seed fused to the ovary wall.

Rubia cordifolia *L.* (*R. longipetiolata* Bullock) (see p. 410)

A climbing herb covered with prickly, recurved hairs and with long-petiolate, cordate, ovate or lanceolate-acuminate leaves; flowers in short axillary cymes, which are produced terminally, greenish-yellow.

A variable plant, examples from western Kenya having narrower leaves and longer petioles, grading into short petioles and cordate-ovate leaves in the east. Common in the margins and clearings of dry woodland as well as in riverine bushland in drier climates. HE, HT, HM, HL, HA, HK, KIT, KIS, NAR, RV, MAC, NBI, KAJ.

Lugard 204; Harmsen 6498.

74. CAPRIFOLIACEAE†

Shrubs or small trees, rarely herbs; leaves opposite, simple or compound; stipules absent or interpetiolar; inflorescence cymose; flowers bisexual, regular or irregular, 4–5-merous; calyx imbricate or open; corolla imbricate with a short or long tube; stamens epipetalous, alternating with petals; ovary inferior with 1–numerous ovules per loculus; fruit a fleshy berry or drupe, or achene.

1. SAMBUCUS *L.*

Shrubs or herbs, stem with thick pith or hollow; leaves pinnate, leaflets serrate; inflorescence cymose; flowers small with a tube shorter than the lobes; ovary 3–5-celled, 1 pendulous ovule per cell; fruit a berry with compressed seeds.

Sambucus africana *Standley* (see p. 413)

Fleshy herb up to 5 m; leaflets obovate, large, sharply serrate, acute-acuminate, asymmetric or irregularly adhering to the petiole, puberulous; calyx minutely lobed; petals white; fruit black, edible.

Found along elephant/buffalo paths in the bamboo zone and montane forest. Dominant where bamboo has flowered and died.

Mathenge 211; Clapham, Greenway, Lind, and Agnew s.n., January 1962.

75. VALERIANACEAE‡

Annual herbs, rarely shrubs; leaves opposite, entire, dentate or pinnatifid, exstipulate; inflorescence paniculate, cymose, flowers bisexual, occasionally unisexual, regular or (mostly) zygomorphic; calyx lobes often rolled up in flower, unrolling to form a feathery pappus in fruit; corolla 3–5-lobed, funnel-shaped, lobes imbricate; stamens 1–4, anthers 2-celled; ovary inferior, 3-celled, 2 cells sterile, the solitary ovule pendulous; stigmas 2–3, free or connate; fruit an achene.

1 Annual; corolla not spurred at base; calyx not forming a feathery pappus in fruit — 2. *Valerianella*
  Perennial; corolla spurred at base; calyx forming a feathery pappus in fruit — 1. *Valeriana*

1. VALERIANA *L.*

Perennial herbs with bitter and peculiar smell; leaves entire, pinnatifid or pinnate; inflorescence cymose, terminal, subcapitate; flowers protandrous, bisexual or unisexual, bracteolate; calyx inrolled in flower, forming a feathery pappus in fruit; corolla 5-lobed, lobes unequal; stamens 3.

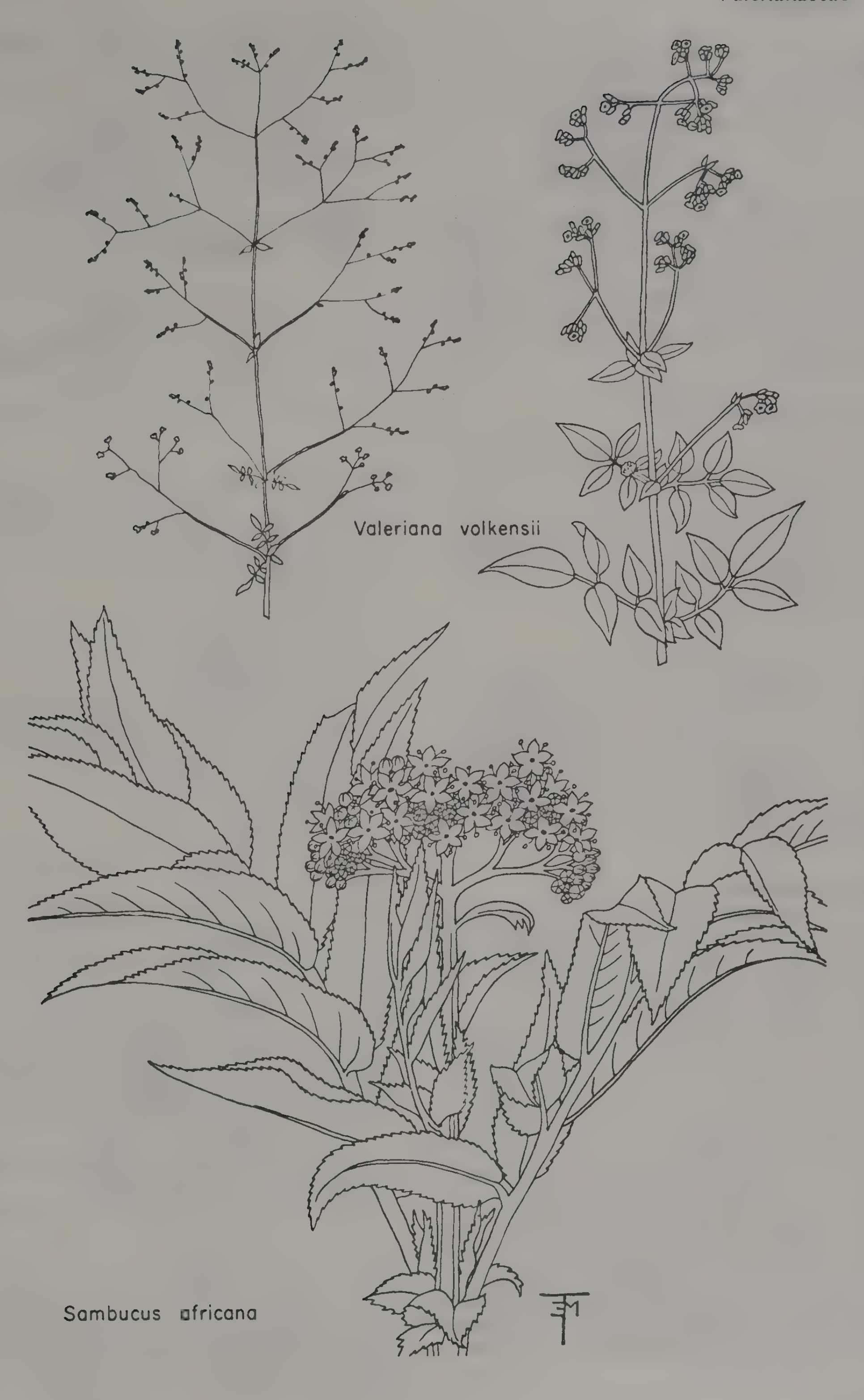
1 Leaves compound — 2
  Leaves simple — 1. *V. kilimandscharica*
2 Leaves 3–5-foliolate; leaflets entire; inflorescence a very lax cyme — 2. *V. volkensii*
  Leaves more than 7-foliolate; leaflets dentate or undulate; inflorescence of clustered flowers or subcapitate — 3. *V. capensis*

1. Valeriana kilimandscharica *Engl.*

Perennial herb with suffrutescent decumbent and shortly ascending stem, often rooting at the nodes; leaves simple, spathulate, connate at base, crenate or entire; inflorescence racemose; fruit ovoid.

† By S. Kibe.

‡ By S. Kibe.


Valeriana volkensii
Sambucus africana

Found in the alpine region in tussock grassland of sloping moist ground amongst other herbs and bryophytes. HE, HA, HK.

Hedberg 1699; Hanid 94.

2. Valeriana volkensii *Engl.* (see p. 413)

Perennial pubescent herb with sparsely branched erect or ascending suffrutescent stem; leaves 3-7-foliolate; with elliptic entire leaflets, the terminal one largest; inflorescence a lax raceme.

Found only on Mt. Elgon on moist ground along streamsides in the bamboo zone. HE.

Gillett 18414.

3. Valeriana capensis *Thunb.*

Erect, delicate perennial herb; stem fleshy, glabrous; leaves more than 7-foliolate; leaflets elliptic, dentate or undulate-crenate; inflorescence terminal, of dense hairy heads.

Found with tussock grasses in stony ground along well-drained streamsides in the ericaceous zone of the Aberdares only. HA.

Coe 757.

2. VALERIANELLA *Mill.*

Annual dichotomously branched herbs; leaves entire, cleft or toothed; flowers in terminal bracteate cymose heads or solitary; calyx persistent, dentate or crown-like, divided into 10-14 subulate lobes; corolla 5-lobed, not spurred or saccate at base; stamens 3, epipetalous; stigma 3-fid; fruit ovoid, glabrous.

Valerianella microcarpa *Lois.*

Erect or spreading, dichotomously branched annual with lower leaves entire, oblong, and upper ones dentate at base; inflorescence very lax cymose with white flowers in forks of the branches and in terminal bracteate heads.

Rare plant found in short alpine vegetation. HK.

Verdcourt 3504 and 3529.

76. DIPSACACEAE†

Annual or perennial herbs; leaves opposite or verticillate, exstipulate; inflorescence a head; flowers bisexual, zygomorphic, protandrous; epicalyx often present; corolla tube 4-5 lobed; stamens usually 4, epipetalous; anthers 2-celled; ovary 1-loculed, ± inferior, sessile with one solitary pendulous ovule; fruit an achene, often enclosed in the epicalyx, 1-seeded; seeds thinly membranous.

† By S. Kibe.

1 Flowering head flat-topped; flowers purple, pinkish or blue — 2
  Flowering head spherical or flat-topped, flowers white or yellowish — 3
2 Plant a weak, prostrate shrub with woody stem; hairs on the fruit branched — 3. *Pterocephalus frutescens*
  Plant a herb without a woody stem; hairs on the fruit not branched — 4. *Scabiosa columbaria*
3 Stem with spines; bracts lanceolate, narrowing gradually to a sharp tip — 1. *Dipsacus pinnatifidus*
  Stem without spines; bracts oblong, apically rounded, sharply mucronate — 2. *Cephalaria pungens*

1. DIPSACUS *L.*

Erect stout biennial herbs; leaves often connate at base, dentate; capitulum subglobose; flowers subtended by stiff, spiny bracts; epicalyx obscure, 4-grooved; corolla tube 4-lobed; stamens 4; ovary inferior; stigma dilated.

Dipsacus pinnatifidus *A. Rich.* (see p. 415)

Erect herb to 2 m; leaves connate at base, ovate to lanceolate, serrate; involucral bracts linear-lanceolate, spiny; flowers white.

Found in the upper forest and lower alpine zones, commonly by streamsides in *Erica* woodland. HE, HM, HA, HK.

Glover *et al.* 1519; Agnew 7279.

2. CEPHALARIA *Schrad.*

Perennial herbs without prickles; leaves entire, dentate or pinnatifid; heads involucrate with imbricating scales shorter than the bracts of the receptacle; epicalyx with 4 small teeth; calyx tube adnate to the inferior ovary; corolla funnel-shaped, 4-lobed; stigma obliquely dilated.

Cephalaria pungens *Szabo* (see p. 415)

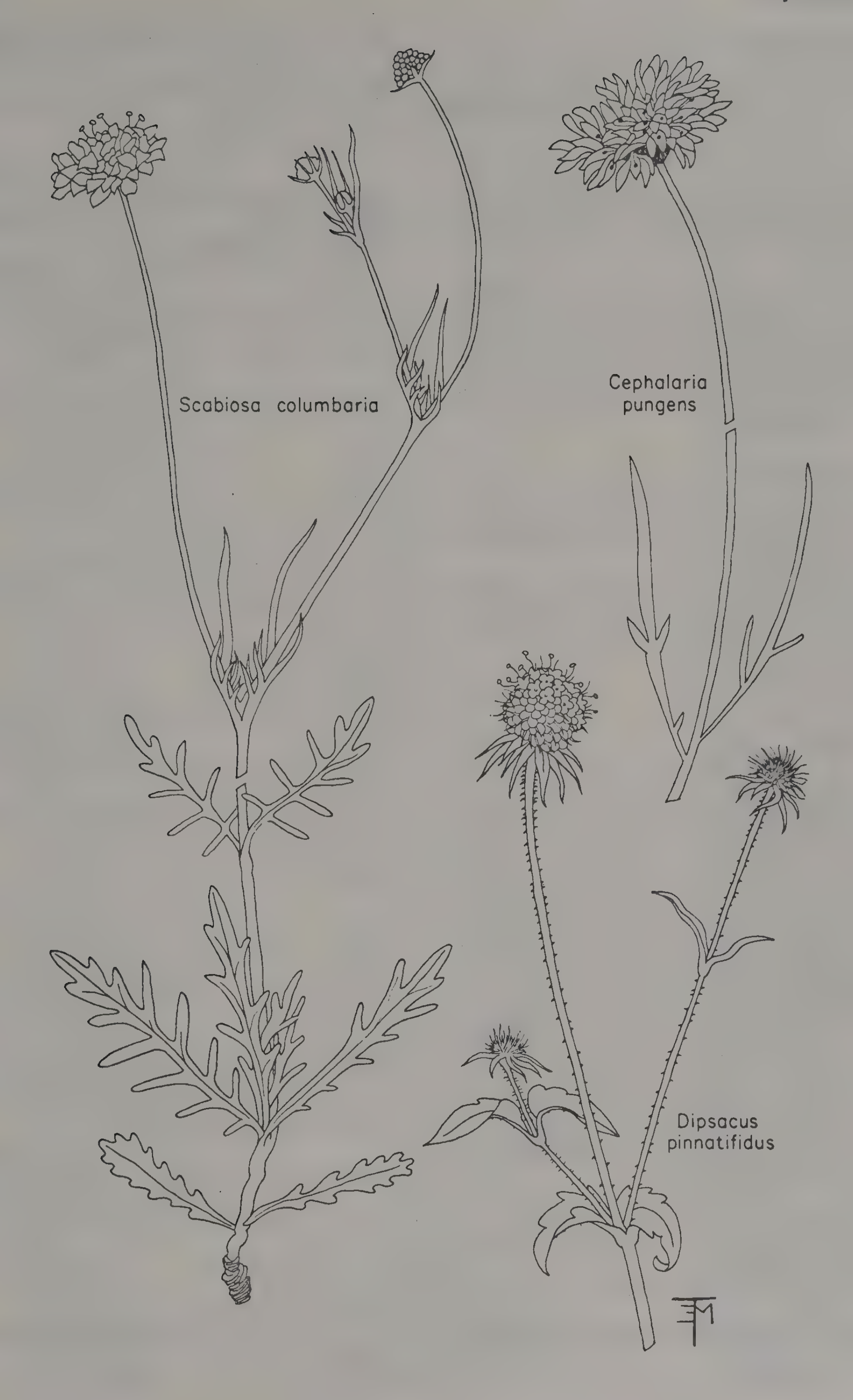
Erect pubescent herb; leaves at base long-spathulate, entire, upper leaves variously toothed or dentate; capitulum flat-topped when in flower; flowers subtended by oblong, mucronate, brown bracts; fruit with a crown of hairs.

Found in montane and subalpine grassland in western Kenya. HE, HC, HM, KIT.

Bally B4782; Agnew, Kibe, and Mathenge 10523.

3. PTEROCEPHALUS *Adans.*

Herbs or shrubs; leaves entire or variously divided (in ours); heads flat or globose; receptacle hairy; calyx enlarged into 12-24 plumose awns in fruit; epicalyx present, hardly expanded, 8-grooved; corolla-tube 5-lobed.


Scabiosa columbaria
Cephalaria pungens
Dipsacus pinnatifidus

Pterocephalus frutescens *Hochst.*

Trailing shrub; leaves linear-lanceolate, entire or variously dentate or divided; involucral bracts ovate, acute, pubescent; flower pinkish-red, pubescent outside.

Found amongst grasses on eroded ground and on stony soils on dry exposed hillsides. HA, HM, NAR, RV, KAJ.

Glover, Gwynne, and Samuel 1310; Hanid 259.

4. SCABIOSA *L.*

Erect or ascending perennial or annual herbs; stem puberulous or glabrous; leaves entire, or variously divided (in ours); heads terminal, flat or globose; receptacle hairy: calyx of 5 bristles in fruit; epicalyx present, 8-grooved, winged in fruit; corolla tube 5-lobed.

Scabiosa columbaria *L.* (see p. 415)

Erect herb from a thick rootstock with a rosette of spathulate, entire or divided leaves; involucral bracts linear-lanceolate, pubescent; corolla pinkish mauve, 5-lobed, velvety.

Found in *Erica* scrub on rocky slopes, streamsides, *Tarchonanthus* and *Philippia* bushland and in forest clearings. HE, HC, HM, HA, HK, KIT, RV, NAN.

Hedberg 129; Isaac A. 31.

77. COMPOSITAE†

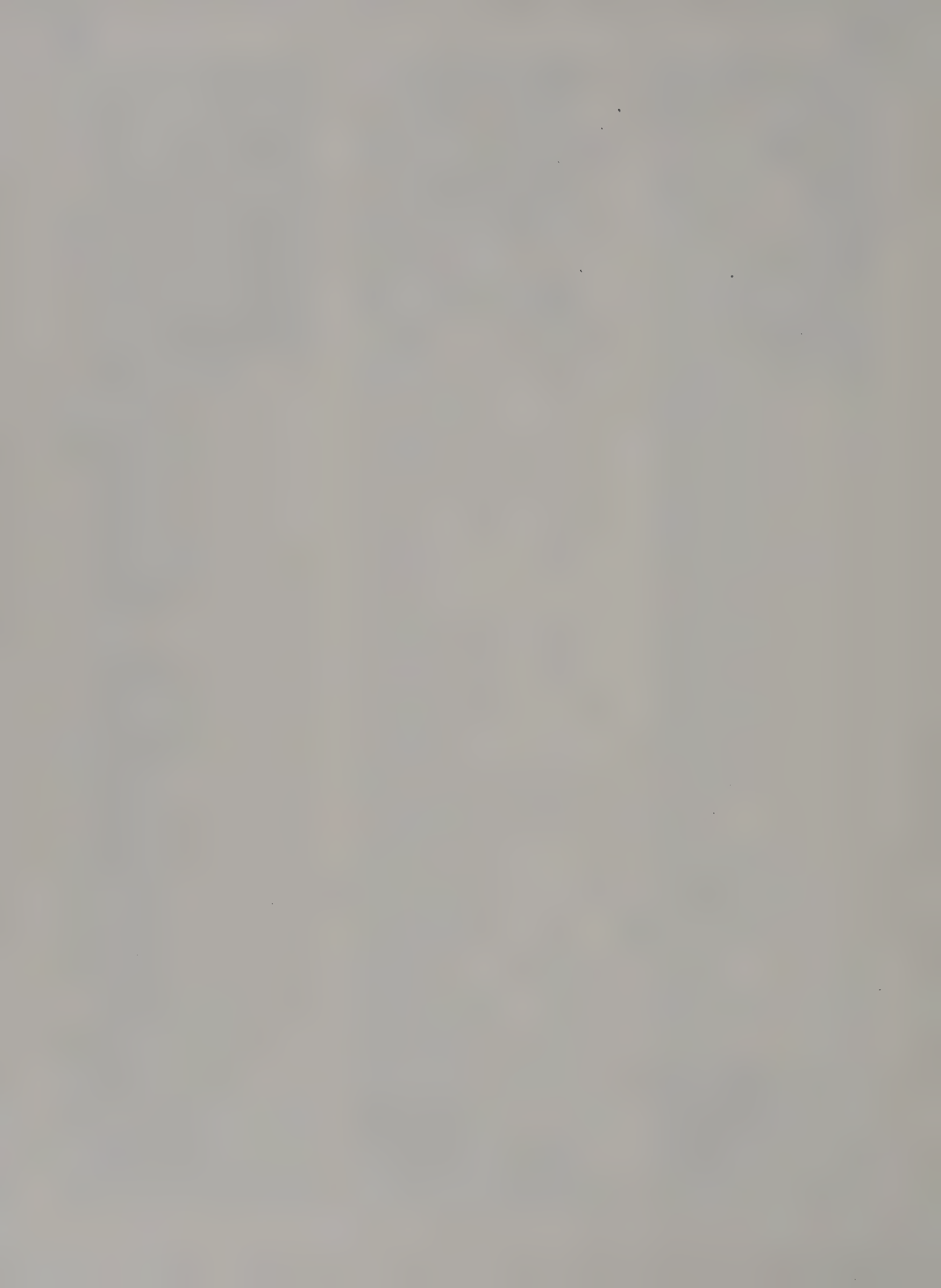
Mostly herbs, with alternate or opposite, entire or divided exstipulate leaves; flowers bisexual, monoecious, polygamous or dioecious, sessile in heads or capitula, surrounded by a series of bracts called *phyllaries* and sometimes subtended by bracts or scales on the receptacle; sepals variously reduced, frequently to scales or bristles (*pappus*); corolla of florets (flowers) of three types: (1) zygomorphic with a spreading 3-toothed ligule, with or without two upright teeth at the apex of the corolla tube, (2) zygomorphic with a spreading 5-toothed ligule at the apex of the tube, (3) regular with 4–5 lobes at the apex of the tube; stamens 5, fused in a ring round the style, the filaments free and joined to the corolla tube; ovary inferior, with one erect ovule and an erect style and bifid stigma; fruit a dry, indehiscent achene, often winged or dispersed by the calyx hairs, rarely fleshy.

1 Tubular florets present; no milky latex — 2
  Only ligulate florets present; milky latex usually present — 104
2 Plants armed with spines on stems and leaves — 3
  Plants without spines on stems and leaves — 8
3 Heads 1-flowered, aggregated into globose 'heads of heads' — 72. *Echinops*
  Heads each with many flowers — 4
4 Ray florets present — 71. *Berkheya spekeana*
  No ray florets present — 5
5 Central florets yellow — 26. *Helichrysum citrispinum*
  All florets purple or white — 6
6 Pappus plumose — 74. *Cirsium*
  Pappus hairs simple or scabrid only — 7
7 Leaves marbled or veined with pale green or white — 75. *Silybum marianum*
  Leaves uniformly green — 73. *Carduus*
8 Leaves opposite, at least the basal ones — 9
  Leaves alternate or plants stemless — 36
9 Achenes each completely enclosed by a hard woody bract, making a disseminule 8–10 mm long; ray florets sterile — 40. *Sclerocarpus africanus*
  Achenes not so enclosed; disseminule usually smaller; ray florets, where present, mostly fertile — 10
10 Rays with a spreading limb present — 11
  Rays absent, or, if marginal zygomorphic florets present, then without a spreading limb — 21
11 Pappus present — 12
  Pappus absent — 17
12 Inner phyllaries fused along their entire length, forming a tube or cone; leaves pinnate — 53. *Tagetes minuta*
  Inner phyllaries free or fused to half-way or less; leaves entire — 13
13 Pappus coroniform or of scales, sometimes with bristles — 14
  Pappus of bristles or hairs only — 15
14 Rays white; annual herb — 50. *Galinsoga parviflora*
  Rays yellow; shrubs — 42. *Aspilia*
15 Pappus plumose; prostrate herb — 49. *Tridax procumbens*
  Pappus simple or scabrid; erect herbs, shrubs, or climbers — 16
16 Pappus of 4–10 caducous bristles, scabrid but not with retrorse barbs; heads more or less spherical in fruit; leaves entire; achenes not compressed — 44. *Melanthera*
  Pappus of 2–4 persistent bristles often with retrorse barbs; heads hemispherical in fruit; leaves mostly divided; achenes compressed — 48. *Bidens*
17 Ray florets white — 39. *Eclipta alba*
  Rays yellow — 18
18 Receptacle conical — 45. *Spilanthes mauritiana*
  Receptacle flat — 19

† By A. D. Q. Agnew.

INDEX

In this index the species names in italics are synonyms, numbers in roman type refer to the page on which the family, genus, or species is described or mentioned, while numbers in bold type refer to plates.








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